electron user

BLAST OFF!
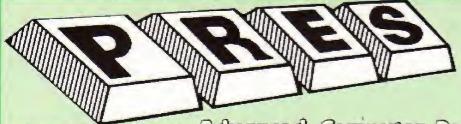
...with ASL'S greatest game

TYPE-IN UTILITIES

Draw impressive 3D pie charts
Turn Basic into machine code
Edit DFS and ADFS discs

FEATURES

Create graphic demonstrations
Remote control your printer
Time warp back to 1985

ARCADE CORNER

ELITE
Full guide to the classic space trading game

CONTENTS

Cover Story

13 Software

Our expert games testers get to grips with Blast, Subway Vigilante and F14 Tomcat.

New source for Electron add-ons

ALREADY well known for its cream and pasties, Cornwall now has another claim to fame as the source of a promising range of new Electron add-ons.

Design engineer David Ingleby-Oddy from Truro has given the Acorn machine a boost by setting up Complex Software Systems which he describes as "a company dedicated to the production of new and exciting products for the Acorn Electron computer".

David's association with the Electron is of long standing and has strengthened over the years.

"It started when I was at college in Swindon", he told *Electron User*. "We used to use BBC Micros there so I bought an Electron which was compatible with BBC Basic.

"Since then I have spent many hours sitting in front of my Electron. As a result of this I feel I can now offer Electron users some things they have not had before".

Complex Software Systems' first and principal product is a sound expansion cartridge which boosts the single sound channel of the Electron to the four channel level of the BBC Micro.

This will give added punch to games and also allows voice synthesis program BBC Speech to be run on the Electron. The new car-

Half million grin

SMALL business package Mini Office from Database Educational Software (0625 878888) has clocked up the sale of its 500,000th copy.

To mark the event a £500 video recorder was presented to the purchaser, Michael Graham, a 24-year-old electrician from Dover-by-Cockermouth, Cumbria. Mini Office broke the price mould when it was initially launched for the Electron and BBC Micro at £5.95. Celebrating Mini Office's success above is Marketing Director Chris Payne.

tridge is a redesign of a former unit produced by David in conjunction with Project Expansions. This also boosted the Electron sound, but was a basic model which never caught on.

The new version comes in a colour coordinated steel case with volume control, outputs for headphones and external amplifiers and an internal loudspeaker.

David has also completely re-written the software to make it more compatible. It is available on disc or tape.

The same size as an AP4 disc interface, the sound expander cartridge fits into the Electron's Plus 1 slot.

As *Electron User* went to press the price of the cartridge had not been fixed but was expected to be between £49 and £55. It was due to go on sale imminently.

Another Electron product

nearing completion in Truro is a Z80 assembler/emulator software package.

Designed as a teaching aid, it allows schools and colleges who want to teach Z80 on the BBC Micro, Electron and Master to write the code and run it on the Electron.

This should be due for release early in the New Year, price to be fixed.

Fans pick Xmas boxes

ELECTRON owners were out in force and buying like fury when 27,000 visitors packed into Alexandra Palace for the first Computer Shopper Show.

That was the word from exhibitors who got through record amounts of Electron software and add-ons at the pre-Christmas bonanza which turned into a gigantic shopping spree.

Such was its success that doors had to be closed on a "one out, one in" basis on the first two days and the Sunday saw radio broadcasts warning prospective visitors of the situation as a late-day queue of 3,000 had to be turned away.

"Visitors to our stand were just bulk buying", said Tynesoft boss Colin Courtney.

"It amounted to panic buying by Electron owners wanting to stock up with software".

Equally busy on the Electron front was John Huddleston of Pres who pronounced it a great success with excellent sales on his Electron add-ons and software.

On the bargain front, Akom was featuring special prices on Electron casette versions of its computer crossword programs.

Education on the Electron also had a good showing. There were good deals to be had on the software ranges from AVP and Rickett Educational Media while H.S.Software was offering up to 40 per cent off its Electron packages.

Keep your secrets

CROWBOROUGH Instruments (0892 662078) has come up with a handy gadget for computer security.

The Viewlock is a key-operated double pole switch which is connected in place of the existing mains plug.

It attaches to the side of the Electron with self-adhesive pads, disables the machine at the turn of a key and costs £22.42.

Gallup Software Chart

THIS MONTH	LAST MONTH	TITLE (Software House)	COMMENTS	PRICE
1	●	**PAPERBOY** *Encore*	Back in the charts after a long absence is this chaotic and destructive child. It's a pity about the flicker and slow speed – get a Turbo.	2.99
2	▽ 1	**PLAY IT AGAIN SAM 10** *Superior*	An excellent arcade compilation presenting you with the golden oldies of Zalaga, 3D Dotty, Repton thru Time and debuting Qwak.	9.95
3	△ 9	**SUPERIOR SOCCER** *Superior*	Brilliant – full-priced and worth every penny. Whether you want to play football or just manage your favourite team you can't go wrong with this.	9.95
4	●	**CHUCKIE EGG** *A & F*	Yes he's back again and this really is an oldie now. One of the first games available, you won't have have egg on your face if you buy it.	9.95
5	●	**STRIKE FORCE HARRIER** *Alternative*	Just available on a familiar budget label, this should do very well and is worth buying if you didn't catch it first time round.	1.99
6	●	**PLAY IT AGAIN SAM 9** *Superior*	Not seen before is Camelot, whereas you can renew your acquaintance with Spycat, Steve Davis and Repton. Really one of the better Sams.	9.95
7	▷ 7	**LAST OF THE FREE** *Audiogenic*	Still selling very well even without a budget label. You may have to search hard to buy this one now, but it's worth it.	7.95
8	●	**CREEPY CAVE** *Atlantis*	A strange place to lose your keys, but stranger things have happened. A fun, colourful and enjoyable romp that will keep you amused.	1.99
9	●	**ANARCHY ZONE** *Atlantis*	Back to outer space and your chance to save the Earth from imminent peril. An addictive shoot-'em-up which will keep you coming back for more.	1.99
10	●	**JOE BLADE** *Players*	The original mission for community conscious Joe. With a third mission about to the hit the streets, buy this one while you can.	1.99
11	●	**VIDEO CLASSICS** *Firebird*	A budget collection of some simple and fun arcade games. This title keeps re-appearing. Definitely cheap and cheerful.	1.99
12	△ 17	**PLAY IT AGAIN SAM 8** *Superior*	The third compilation this month with Winter Olympiad, Quest, Around the World in 40 Screens and Mr Wiz taking starring roles.	9.95
13	▽ 4	**SUBWAY VIGILANTE** *Players*	Yes, the London Underground is your responsibility in this kick-'em, hit-'em. Though disappointing, it's nice to see a new game.	2.99
14	●	**LIFE OF REPTON** *Superior*	Ever wondered what a baby Repton looks like, or what Repton will do when he retires? This is your chance to find out.	6.95
15	△ 18	**SNAPPER** *Acornsoft*	If you search hard you can still find this full-priced version. Though it's better value as part of the Sam 7 compilation.	9.95
16	●	**FELIX IN THE FACTORY** *Micropower*	A full-priced oldie which is well worth playing again. Though not a classic, it's an amusing way to while away an idle moment.	9.95
17	●	**ELITE** *Superior*	Electron users had to wait for this BBC Micro classic. If you haven't been hooked by it, you soon will be. One of the best games ever.	12.95
18	●	**PERCY PENGUIN** *Blue Ribbon*	An old favourite given a new lease of life by Blue Ribbon. If he doesn't feature as part of your collection he should do.	1.99
19	△ 20	**SMASH AND GRAB** *Blue Ribbon*	If you're feeling especially villainous and dastardly you can break the law in this budget title. Playable and addictive.	1.99
20	●	**INVADERS** *Mirrorsoft*	Not seen around much these days, but as expected from Mirrorsoft it's good quality. Might be worth waiting for the budget offering though.	9.95

FEW games have such a wide ranging appeal as Elite, and though it is a relatively old game – even Repton is a mere youngster in comparison – it is still extremely popular. Many newcomers to the Electron world have bought this classic title and there are quite a number of readers struggling at the controls of their Cobra Mk III in deep space.

It is also a long time since we published hints and tips for this game, so this month Christopher Chadwick provides welcome help for space traders. No cheat modes – that would make the game too easy, just good advice.

The first trade run

The object of the game is to stay alive and eventually join the ranks of the Elite. This invariably involves writing off several Cobra Mk III spaceships, but you can afford it. In staying alive, several things will happen: You earn credits, your combat rating improves and your legal status may vary. It is impossible to improve any of these without improving the others at the same time.

At the start you will have read the manual and practised departing and docking at Lave. All you have is 100 credits, plus any extra you may have earned by atomising asteroids – always worth 0.5 credits.

Buy wine at Lave, set the controls for Leesti and take off. Remember you are trying to stay alive, so at this stage spare the heroics and get into hyperspace straight away. You are at great risk in space and this can only be minimised by spending as little time in flight as possible.

On arrival at Leesti sell the wine and buy computers. Refuel, re-arm and return to Lave to sell the computers. Repeat this trading run for as long as you can stand it.

If you can find a run between poor agricultural and poor industrial systems of safe political persuasion, use it. The best legal

Dont cheat, beat Elite

profits are to be had in computers – industrial to agricultural – and furs – agricultural to industrial.

You cannot hope to trade effectively until you have enough credits to equip your ship for combat. The essential items are:

Equipment	Credits
Large cargo bay	400
ECM system	600
Front beam laser	1000
Extra energy unit	1500

When you have earned about 1,200 credits consider buying the large cargo bay, which will boost your carrying capacity from a tiny 20 tonnes to a more useful 35

tonnes, thus increasing your potential profit.

There isn't any point in carrying around large amounts of spare cash which could be cargo. The galaxy is not over-blessed with building societies, so you must fill your hold to the brim.

You should be able to make around 500 credits or more per journey, and so afford the beam laser and ECM within four to five runs. As a rule of thumb, don't buy extra equipment before buying fuel, missiles and cargo. There is no point in being well equipped but unable to buy cargo – and with not enough fuel to fly anywhere to sell it in any case.

The ECM system is essential. It is the only reliable way to stop missiles dead, and every one destroyed counts as a kill towards your next status rating.

The difference between the standard pulse laser and the mighty beam laser is roughly analogous to the difference between the little one that is used in your CD player and the steel cutting beast that nearly split James Bond in two in Goldfinger. Get one before one gets you.

The true cost of a new laser includes a refund on any that it replaces. So when uprating a front pulse laser to a beam laser you should subtract the cost of a pulse laser from that of the new weapon.

The disadvantage of the beam laser and ECM is their heavy energy consumption. You have the kit, but not the power. An EEU comes into its own by increasing your energy replenishment rate.

Tips from space

Regard your own missiles as purely defensive weapons. Don't target asteroids, as missiles are too expensive to waste – use lasers instead. If the E symbol appears on the screen after firing a missile don't fire again unless you are right on top of your target. The symbol means that your enemy is equipped with an ECM, which largely renders your missiles useless. The only hope you have is to get a missile into him before he can prime his ECM.

Bear in mind that there can be a considerable delay between firing and contact with the target. Are your ship's defences up to scratch?

Without an ECM you will only survive the impact of an enemy missile if your shields are fully charged and you have adequate energy to sustain the blow. The best defence is to hyperspace to another star system, but this is rarely practical.

Your remaining alternative is to accelerate to full speed and duck and weave until you can start shooting at it. If successful you will earn a kill point towards your next status promotion.

Insurance

To avoid starting at the very beginning each time you are destroyed, save your position

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to tape every time you dock. This also saves your position in ram and answering N to the "Load new commander?" prompt returns you to the last space station.

As you progress, you can buy an escape capsule for 1,000 credits. By pressing Escape before your ship explodes you will be transported to the space station in the current system. Once there, you will receive a new Cobra Mk III, identical to the one you had before.

How to survive

Apart from political organisation, planets are also classified by their economic system and wealth. The best traders head for the very rich and the very poor as very few advantageous opportunities exist among the Average classes who are not Feudal.

However, try to avoid Anarchy and Feudal planet systems until you are Competent with credits to spare. The pirates in these systems are quite adept at knocking out ECMs, EEUs and docking computers, as well as any cargo you may be carrying.

It is good practice to cover your back by setting the hyperdrive for somewhere safe immediately on entering a dangerous system. If you are hurrying to leave, then looking at an information page rather than the

starscape will speed up the countdown.

Learn to interpret the various flight patterns of the different craft from their appearance on the flight grid scanner. The sooner you spot potential trouble, the better. It is easy to detect the presence of pirates and react appropriately – get them in your crosshairs, prime a missile and start lasering.

They show little skill, but work mob handed. When you fly through the pack they scatter and are easy to pick off. Until then they can cause considerable harm and may need a missile or two.

Vipers are invariably police craft, so avoid engaging them until you become skilled at combat, have a beam laser and fancy becoming a fugitive.

When heading for a planet set the crosshairs for the centre. Should unidentified company appear, roll the ship so that the enemy is ahead and above, but keep the planet straight ahead. If it attacks and you want to retaliate, lose speed, climb until the target is dead ahead and engage in battle. Have a missile targeted ready for use if necessary, but don't wait too long if he keeps hitting while you are missing.

If you find yourself suddenly under attack, but you can't see the enemy, see which shield – front or rear – is diminishing. Stop and dive, accelerate and roll. The attacker should now be showing on the radar.

Get into the habit of disarming the missiles when there is no immediate use for them,

especially when approaching a space station. It is foolish to inadvertently target and fire on a space station at which you wish to dock. Firstly, they won't let you in, and secondly, the police come out and attack.

If you pick a fight within range of a space station and you intend to dock, use your docking computer without delay. Of course, if you want to pick a fight, just shoot at a space station and blast the police as they come out.

Unfortunately, it occasionally happens that villains start to attack you in a space station controlled area. If this occurs you won't get any help from the police (you can never find a policeman when you want one). If you haven't got a docking computer it is best to chase the enemy out of the area, keeping the station behind you and then destroy him.

After a battle your ship's defenses will be weakened. The only way they can be recharged is to fly at full throttle, straight and level. If you use the jump key you will attract pirates and other undesirables capable of making mincemeat out of a weakened Cobra Mk III.

Always keep an eye on your energy level and shield strength. Shields are especially crucial, because they can diminish to the point where energy is taken directly from the energy banks, and this is fatal.

Finally, the most important tip is that you never know enough not to re-read the training manual!

WHEN I retired I bought an Electron and soon became hooked. Since then I have typed in many programs from *Electron User* and also bought many games. Now I have something like 400 programs.

With such a large amount of software I found considerable difficulty locating the disc or tape with the program that I wanted and so I created a simple database utility. That seems a long time ago now and in the course of time the database has been modified and extended to provide more facilities. In its present form it is comprehensive and user friendly, capable of being amended for different purposes.

Type in the program listing and save it. When it is run you will be presented with a title page, followed by a menu screen. First select option zero and you will be asked how many entries you wish to make (more can be added later). At the prompt, enter the title, the disc reference number (zero if not on disc), and the tape reference (zero if not on tape).

Option one allows you to browse through the database one screenfull at a time. You press Shift to see the next screen. Option two sorts the database entries into alphabetical order.

To add another title press option three and enter the information at the prompts. Option four gives an opportunity to delete a title. Options five and six let you to change the disc and tape reference numbers, for instance, if you transfer a program from tape to disc.

Options seven and eight allow you to save and load the data file from tape or disc. Finally, option nine outputs the database to the printer.

Why waste time laboriously cataloguing tapes and discs looking for a particular program? With this handy utility you will be able to search and locate any program in a matter of seconds.

```
            5 Titles
Choose one of these numbers:-
       0...Begin again.
       1...Read list.
       2...Sort Alphabetical order.
       3...Add title to list.
       4...Remove title from list.
       5...Change all disk/tape refs.
       6...Change one disk/tape ref.
       7...Save on disc/tape.
       8...Recover from disc/tape.
       9...Send to Printer.
```

Filing floppies and tapes

Keep track of your software with Bill Millican's utility

```
  10 REM Disk/Tape Index
  20 REM By Bill Millican
  30 REM (c) Electron User
  40 *KEY1 PROCmenu M
  50 VDU19,1,3;0;:COLOUR1
  60 DIM title$(200),disk(200),t
apes(200)
  70 total=0
  80 PROCintro
  90 :
 100 PROCmenu
 110 DEFPROCmenu
 120 CLS:VDU19,1,2;0;
 130 PRINTTAB(15,1);total;" Titl
es"
 140 PRINT'"Choose one of these
numbers:-"
 150 PRINT'SPC(5)"0...Begin agai
n."
 160 PRINT'SPC(5)"1...Read list.
"
 170 PRINT'SPC(5)"2...Sort Alpha
betical order."
 180 PRINT'SPC(5)"3...Add title
to list."
 190 PRINT'SPC(5)"4...Remove tit
le from list."
 200 PRINT'SPC(5)"5...Change all
 disk/tape refs."
```

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```
   210 PRINT'SPC(5)"6...Change one
disk/tape ref."
   220 PRINT'SPC(5)"7...Save on di
sc/tape."
   230 PRINT'SPC(5)"8...Recover fr
om disc/tape."
   240 PRINT'SPC(5)"9...Send to Pr
inter."
   250 Z=GET:IFZ<48 OR Z>57 THEN 2
50
   260 Z=Z-47
   270 ON Z GOTO290,300,310,320,33
0,340,350,360,370,380
   280 ENDPROC
   290 PROCbegin:GOTO100
   300 PROCread:GOTO100
   310 PROCalpha:GOTO100
   320 PROCadd:GOTO100
   330 PROCremove:GOTO100
   340 PROCallchange:GOTO090
   350 PROConechange:GOTO100
   360 PROCsave:GOTO100
   370 PROCrecover:GOTO100
   380 PROCprinter:GOTO100
   390 :
   400 DEFPROCintro
   410 CLS
   420 PRINT
   430 PRINT
   440 PRINTSPC5"**** DISK & TAPE
INDEX ****"
   450 PRINT''SPC7"(by Bill Millic
an '89)"
   460 PRINT''SPC12"Volume No.1 "
   470 PRINT'SPC4"Programs on both
Disk and Tape."
   480 REM
   490 PRINT''SPC3"It will accept
approx.200 titles."
   500 PRINT''"You are given the op
tion of saving and  loading eithe
r from disc and/or tape."
   510 PRINT'"To return to the MEN
U at any time press Func 1 or typ
e:-GOTO090"
   520 PROCholdscreen
   530 ENDPROC
   540 :
   550 DEFPROCholdscreen
   560 PRINT'SPC8"Press the SPACE-
bar."
   570 ZZ=GET
   580 ENDPROC
   590 :
   600 DEFPROCbegin
   610 CLS
   620 INPUT'SPC8"How many Titles
",total
   630 PRINT:FORcount=1TOtotal
   640 IFcount=1 THEN660
   650 PRINT"Now next title."
   660 INPUT"Title "title$(count)
   670 INPUT"Now the disk number "
disk(count)
   680 INPUT"Now the tape ref.    "
tape$(count)
   690 PRINT:NEXTcount
   700 PRINT'''"That was the last t
itle."
   710 PROCholdscreen
   720 ENDPROC
   730 :
   740 DEFPROCread
   750 CLS
   760 VDU14
   770 PRINT'SPC5"Title"SPC15"Disk
"SPC4"Tape"''
   780 FORcount=1TO total
   790 PRINTtitle$(count);TAB(26)d
isk(count);TAB(33)tape$(count)
```

```
   800 NEXTcount
   810 PROCholdscreen
   820 ENDPROC
   830 :
   840 DEFPROCalpha
   850 CLS
   860 PRINT"Titles being put int
o alphabetical order!"'"Be patie
nt~-it can take a long time if th
ere are many entries!"''
   870 j=0
   880 FORcount=1TOtotal-1
   890 IF title$(count)<=title$(co
unt+1) THEN960
   900 x$=title$(count+1):x1=disk(
count+1):x2$=tape$(count+1)
   910 title$(count+1)=title$(coun
t)
   920 disk(count+1)=disk(count)
   930 tape$(count+1)=tape$(count)
   940 title$(count)=x$:disk(count
)=x1:tape$(count)=x2$
   950 j=j+1
   960 NEXTcount
   970 IFj>0 THEN870
   980 PRINT'SPC6"Now in alpabetic
al order."
   990 PROCholdscreen
  1000 ENDPROC
  1010 :
  1020 DEFPROCadd
  1030 CLS
  1040 INPUT"Name of new title "n
ew$
  1050 INPUT'"Disk number of new t
itle "ndisk
  1060 INPUT'"Tape ref.of new titl
e  "ntape$
  1070 total=total+1
  1080 title$(total)=new$
  1090 disk(total)=ndisk
  1100 tape$(total)=ntape$
  1110 PRINT'"New title now entere
d."
  1120 INPUT''"Any more ( Y / N )"
,ans$
  1130 IFans$="Y" GOTO1030 ELSE PR
OCholdscreen
  1140 REM PROCholdscreen
  1150 ENDPROC
  1160 :
  1170 DEFPROCremove
  1180 CLS
  1190 INPUT'"Title to be removed
"remove$
  1200 FORcount=1TOtotal
  1210 IF title$(count)=remove$ TH
EN1250
  1220 NEXTcount
  1230 PRINT'"Not on list"'
  1240 GOTO1450
  1250 FOR j=count TO total-1
  1260 title$(j)=title$(j+1):disk(
j)=disk(j+1):tape$(j)=tape$(j+1)
  1270 NEXTj
  1280 title$(total)=" ":disk(tota
l)=0
  1290 total=total-1
  1300 PRINT'"Now removed"
  1310 PROCholdscreen
  1320 ENDPROC
  1330 :
  1340 DEFPROCallchange
  1350 CLS
  1360 PRINT"Input new disk numbe
rs/tape refs."
  1370 FORcount=1TOtotal
  1380 PRINT"D " title$(count);TAB
(15);:INPUT disk(count)
  1390 PRINT"T " title$(count);TAB
(15);:INPUT tape$(count)
  1400 NEXTcount
```

```
  1410 PRINT'"New disk numbers & t
ape refs. now       entered,"
  1420 PROCholdscreen
  1430 ENDPROC
  1440 :
  1450 DEFPROConechange
  1460 CLS
  1470 INPUT"Title name ",tit$
  1480 FORcount=1TOtotal
  1490 IF tit$=title$(count) THEN
1540
  1500 NEXTcount
  1510 PRINT'"Not on the list."
  1520 PROCholdscreen
  1530 GOTO1580
  1540 INPUT'"Enter the new disk n
umber ",disk(count)
  1550 INPUT'"Enter the new tape r
ef.",tape$(count)
  1560 count=total
  1570 PROCholdscreen
  1580 ENDPROC
  1590 :
  1600 DEFPROCsave
  1610 CLS
  1620 INPUT''"Save to (D)isc or (
T)ape "Q$:IF Q$="D" THEN 1630 ELS
E IF Q$="T" THEN 1640
  1630 OSCLI"*DISK":PRINT"Data no
w being stored on disc.":GOTO1650
  1640 OSCLI"*TAPE":PRINT"Data no
w being stored on tape."
  1650 X=OPENOUT"DATA"
  1660 :
  1670 FORcount=1TOtotal
  1680 PRINT# X,title$(count)
  1690 PRINT# X,disk(count)
  1700 PRINT# X,tape$(count)
  1710 NEXTcount
  1720 CLOSE# X
  1730 PRINT"data now saved."
  1740 PROCholdscreen
  1750 ENDPROC
  1760 :
  1770 DEFPROCrecover
  1780 CLS
  1790 PRINT'"Insert DATA disc or
tape."
  1800 INPUT''"Recover from (D)isc
or (T)ape.";Q$
  1810 IF Q$="D" THEN 1820 ELSE IF
Q$="T" THEN 1830
  1820 OSCLI"*DISK":PRINT"Data no
w being recovered from disc.":GOT
O1850
  1830 OSCLI"*TAPE":PRINT"Data no
w being recovered from tape."
  1840 :
  1850 FORD=0TO2000:NEXTD
  1860 :
  1870 total=0
  1880 X=OPENIN"DATA"
  1890 :
  1900 REPEAT
  1910 total=total+1
  1920 INPUT# X,title$(total)
  1930 INPUT# X,disk(total)
  1940 INPUT# X,tape$(total)
  1950 UNTIL EOF# X
  1960 CLOSE# X
  1970 PRINT'SPC8"Data now loaded.
"
  1980 PROCholdscreen
  1990 ENDPROC
  2000 :
  2010 DEFPROCprinter
  2020 VDU2
  2030 *FX6,0
  2040 VDU1,27,1,108,1,5
  2050 PROCread
  2060 PRINT
  2070 ENDPROC
```

Product: Subway Vigilante
Price: £2.99
Supplier: Players, Mercury House, Calleva Park, Aldermaston, Berkshire RG7 4QW.
Tel: 0734 817421

SUBWAY Vigilate from Players is set several years in the future when London's Underground network has degenerated into a battleground, with drug dealers, pushers, punks and muggers fighting for supremacy. You step into this hell-hole as the Subway Vigilante, determined to rid the underground of these evil beings so that the normal, law abiding passenger can enjoy a safe journey.

This scenario provides the backdrop for a great deal of violent punching, kicking and head butting. The game takes place on a platform of a London Underground station. This is portrayed in full and glorious black and white – unlike the screen shots shown on the cassette instructions which look more like Spectrum ones. The playing area is made up of the lower part of the screen. The opposition are also shown in black and white along with you, the hero of the game.

You seem to have two opponents all of the time and when you manage to flatten one, it mutates into the next order of species. These may be armed with a device which looks like a chain saw, but as far as I can make out, they are no more difficult to deal with than the previous beasts. If you are knocked down, you too can get up, as you have five lives.

The controls are simple – four keys can move you forwards, backwards, left and right around the platform and in conjunction with the fire key various jabs, butts, punches and kicks are produced.

Doing damage to an opponent seemed to depend to a large extent on luck. On numerous occasions I punched one of these evil characters only to see the other one fall over. I also think they may do in each other from time to time.

You soon develop a simple strategy. If you move to the left of the screen and stand there performing flying kicks, you can beat the opposition and only rarely get flattened yourself.

If you do well enough, you are asked to start your tape recorder. This loads up a different scene, but it makes no difference to the gameplay. I think this second screen, which features skull and crossbones and Nazi insignia is the last. Despite some fairly large scores (obtained with the stand-at-the-left strategy), I have not seen any more.

All this leaves us with a very simple game. The loading screen portraying some fairly ugly customers is probably its best part. But lack of colour, inept beeps and poor animation all indicate one to be left on the shop shelf.

Rog Frost

Graphics	10
Sound	4
Playability	5
Value for money	6
Overall	6
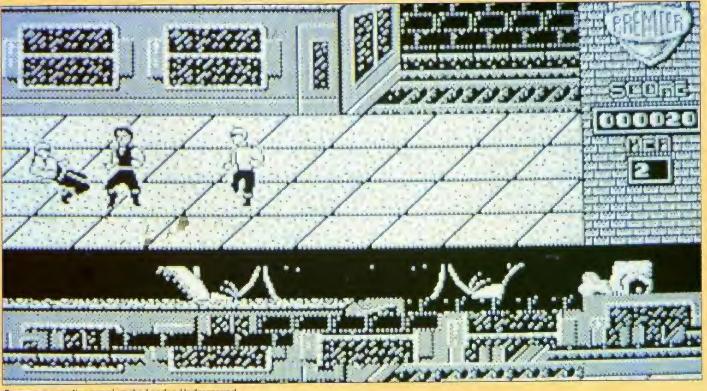
Second Opinion

Graphically, Subway Vigilante is superb. The loading screen is a well drawn Mode 4 picture showing three thugs, and the game graphics – again Mode 4 – have detailed backgrounds and superbly drawn and animated sprite-like characters.

Like many martial arts games, you can usually beat each opponent with just a couple of moves. Consequently the game becomes quite dull as you repeat each manoeuvre over and over again.

Roland Waddilove

Mash a mugger

Become a guardian angel on the London Underground

Blast

GOLDEN
electron user
GAME

IT all begins as a straightforward astro-geological survey of an anti-matter planet in the outer reaches of the galaxy. As you make your final approach there is a rumbling below your ship, the ground falls away beneath you, and you tumble into the abyss.

After minutes of grappling with the controls you finally manage to stabilise the ship only to find yourself in the first of eight alien caverns.

Blast!, from ASL, is based quite unashamedly on the Superior Software classic – Thrust. Most of the original elements are there – the small triangular spaceship, the relentless pull of gravity, and the ever-present threat of alien attack.

Unlike the multi-screen, scrolling, backgrounds of Thrust, Blast! limits the size of its caverns to a single screen and achieves its complexity by reducing the size of the sprites. The game controls are very similar, allowing ship rotation, thrust and fire. There is no tractor beam because you aren't required to collect any power units.
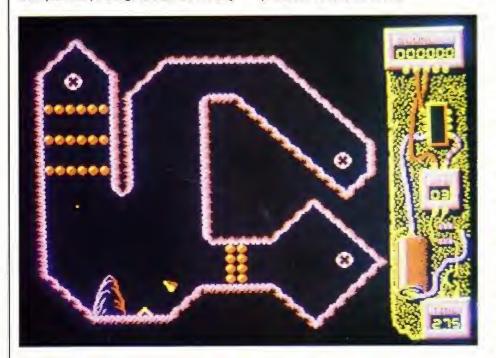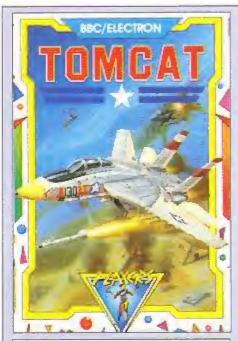
Not only does ASL provide a facility for fussy players to define their own control keys, it also panders to the needs of those less wealthy Electron gamesters who are condemned to play on a monochrome monitor. During the loading procedure you are asked what type of display you will be using; a monochrome reply results in the program defaulting to a selection of colours more suited to your needs.

The object of the game is to destroy all alien command centres of which there are three in each cavern. With these out of the way you are free to attempt the next level. Not surprisingly, the aliens aren't going to leave their command centres sitting around for any old Tom, Dick, or astro-geologist to blow to pieces.

The alien offence/defence system consists of several categories. Wall-mounted gun emplacements that loose a constant volley of randomly aimed laser blasts, highly mobile, but dumb, catherine wheel devices

Flying high

TOMCAT, Players' second title released this month, takes place in the first half of the 21st century. Land has become scarce and expensive so large artificial islands were created at sea. One, Artrock 6, is used as a defense installation and is completely automated.

Unfortunately, a freak storm has damaged the controlling software causing the automatic defences to go berserk and anything approaching the island is destroyed. You as the pilot an American F14 Tomcat fighter are sent in to destroy the base.

The fine loading screen depicting an F14 Tomcat fighter is followed by an even better Mode 4 graphic display. Overlaid on this picture is the small playing window in which you get a bird's eye view of the plane flying low over the island.

These graphics are quite detailed, but the green colouring caused unpleasant stripes on my colour TV. I found it better if I switched off the colour. The display on a monitor is excellent with no colour problems.

You can fly your plane forwards, backwards, left and right, the playing window scrolling smoothly in the appropriate direction to reveal more of the landscape.

Gun emplacements pop up from the ground, swivel round and fire cannons at you while aircraft attack from the front. These can all be easily shot with your own cannon, but their sheer numbers can be overwhelming and it is easy to lose a couple of lives very quickly.

The speed of animation is sluggish, slowing even more when several objects are on screen at the same time. Switch on your Slogger Turbo, however, and the game speeds up to quite an acceptable rate.

I find it impossible to play for more than a few minutes as the frustration factor is far too high. A friend of mine has seen level two, which is much the same as level one apart from the background. The cassette files indicate that there are four levels.

While we should all be pleased that Players are sticking with the Electron mar-

trundle around the cavern walls, and less mobile, but not so dumb, homing mines gravitate towards you relentlessly.

In addition to the indestructible cavern walls there are rows of little barrier blobs that create temporary obstructions throughout the caverns. The accessibility of some of the command centres is restricted by the physical shape of the cavern itself – nasty little narrow and angled corridors are often the only route to a centre.

On the higher levels the complexity and ferocity of the onslaught increases quite dramatically. Volcanic eruptions belch streams of explosive bubbles across your path. On level four the usually obstructive, but immobile, barrier blobs succumb to the effects of gravity and begin tumbling from the skies.

The leisurely, but thoughtful, approach that has served you so well in the previous levels now has to be abandoned in favour of a less systematic, blast everything, technique. It is at times like this that you really appreciate your ship's auto-fire cannon.

You begin the game with three spaceships, each having infinite supplies of fuel and firepower. Such generosity enables the cautious player to take his or her time to complete each cavern without loss of life.

On the other hand the Joe Cool space aces out there are most welcome to try and take out the command centres before the count down timer reaches zero, thereby qualifying for a handsome bonus.

Blast! has managed to re-create the physics that worked so well for Thrust. Minute blips of thrust are necessary to maintain the ships position in space and all sideways drifts have to be compensated for with a brief thrust in the appropriate direction.

When you are expected to fly a ship through tortuously twisting narrow caverns the accuracy of the collision detection routines is of paramount importance. There is nothing more frustrating to an ace pilot than to see his ship consumed by flame when he knows for certain that he missed the wall with millimetres to spare.

Blast's routines are perfection. You can fly your ship to within a pixel of an object in complete confidence, knowing that the craft will not spontaneously combust.

The graphics used throughout will never win any prizes for style or originality, but I don't consider this to be a major failing. Blast's main strength is its superb gameplay.

This is a game that responds to the skilful player. With four fingers working in unison

the ace pilot can pivot his craft is the narrowest of tunnels while simultaneously blasting mines and command centres.

Within half an hour you can be flinging the ship about at high speed on the lower levels in an attempt to reap the largest possible time bonus. I enjoyed it and I'm sure you will too.

Steve Brook

Sound	7
Graphics	7
Playability	9
Value for money	8
Overall	8

SecondOpinion

There is no doubt as to where the programmer of Blast got the idea for this arcade game – Thrust. The graphics are different, but the gameplay is essentially the same.

Fly your spaceship through the caverns and destroy the alien command centres. Your ship has momentum and also weight, making it difficult to manoeuvre in small spaces – most of the caverns are small and have gun emplacements too.

Blast is good, addictive fun and will appeal to all Thrust devotees. However, it is quite expensive.

Roland Waddilove

---

ket, perhaps future offerings could be more playable than this one.

Rog Frost

Graphics	10
Sound	4
Playability	5
Value for money	6
Overall	6
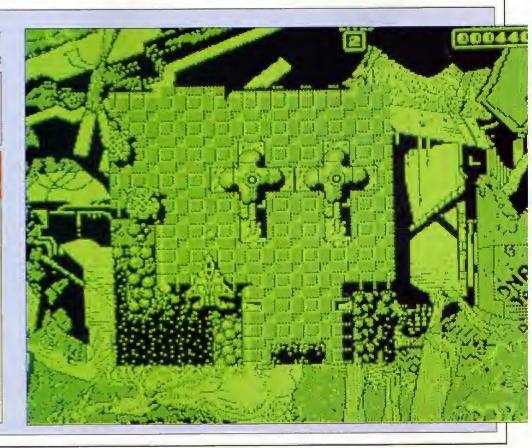
SecondOpinion

Graphically, Tomcat is brilliant. The loading screens are superbly drawn and the game graphics are among the best seen on the Electron. In parts, Tomcat features parallax scrolling where one section of the background scrolls at a different rate to another section – this is the first time this has been attempted on the Electron.

Unfortunately, the poor Electron hasn't got the brute processing power to implement this type of format. Players is to be commended for attempting it and Turbo owners will find it a graphic delight. Don't bother if you have an ordinary, slow Electron.

Roland Waddilove

Electronic sunburst

John Geraghty offers an impressive graphic demonstration of the Electron's capabilities

WE have seen many graphic demonstrations over the past seven years at *Electron User*, but none have impressed us so much as this amazing sunburst display. The speed, colours and effects are stunning and superbly show off the micro's power.

It is said that the simplest ideas are often best, and when it comes to producing fascinating displays on your micro there is none simpler or better than the Roses algorithm. To see an example of this enter and run Sunburst I.

All this program does is accept an input of an angle, and repeatedly turning through this angle, draws about a central point. However, note what happens if you enter a number which is an exact divisor of 360 – you get a regular polygon. Otherwise the design goes around several times before returning to the initial point. Try entering 222 and see what happens. You should get the display shown in Figure I.

The trick of the Roses algorithm is simply to make the radius, *R%*, of the design a variable rather than a constant. Enter the following lines, then enter 222 for the degree increment:

```
 45 INPUT "Radius factor";n%
 90 R%=FNr
255 R%=FNr
300 DEF FNr
310 =500*COS RAD(deg%*n%)
```

Try different values and see what happens.

This is the basic algorithm. It can be taken further by adding colour and using triangle plotting to produce a solid design. Enter these lines and again try 222 and 6 when prompted:

```
101 MOVE FNx,FNy
256 GCOL 3,R% MOD7 +1
260 PLOT 85,FNx,FNy
```

This is the type of pattern produced by the second program, Sunburst II. In addition, there are several machine code routines to overlay stippled colours, change the palette and scroll the screen, giving a constantly changing display.

Sunburst II features a cycle of six patterns, each lasting several minutes. The data – degree increment and radius factor – for each pattern is held in pairs in a data statement at the end of the listing. You may be able to find additional values and incorporate them – just make sure the data ends with the dummy values 999,999.

The high resolution display and large array consume a lot of memory, so there aren't any REM statements in the program. Here is the outline:

PROCtitle: Draws the title screen mask in colour eight, which is invisible because the flashing colours have been turned off by *FX9. When the pattern is drawn by PROCpattern, everything inside the mask is in colours 8 to 15 and everything outside is in colours 0 to 7. The pattern is EORed on to the screen, and because colours 0 to 7 have been defined as background only the masked area can be seen. Later, colours 0 to 7 are redefined to show the whole screen.

PROCinit: Sets up the variables, assembles the machine code and works out the VDU codes for the first pattern using FNpoint. This function returns TRUE when the data set is complete. While this is going on the machine code routine *Rnd–col* clears the screen in a random way.

FNpoint: Works out the colour and the coordinates of the next point. The Basic SIN and COS functions aren't used as it is quicker to work them out from the previous values.

PROCfx: Calls PROCpat–init to reset the variables for the next pattern. The data for the new pattern is calculated in the time interval caused by the delay. It also switches the colour palette according to whether the title screen is showing or not. This is determined by the flag *title%*. Finally, it can apply an overlay of stippled colours in various ways.

Feel free to experiment with the pattern data at the end of the listing – there are many more interesting and colourful patterns just waiting to be discovered.

```
10 REM Sunburst I
20 REM By John Geraghty
30 REM (c) Electron User
40 MODE2
50 GCOL0,7
60 INPUT''"degree increment";d
eg inc%
70 CLS
80 GCOL0,7
90 VDU29,640;512;
100 deg%=0
110 R%=500
120 MOVE FNx,FNy
130 :
140 REPEAT
150 PROCpoint
160 UNTIL deg%=0
170 PROCpoint
180 END
190 :
200 DEF FNx
210 =R%*SINRADdeg%
220 :
230 DEF FNy
240 =R%*COSRADdeg%
250 :
260 DEF PROCpoint
270 deg%=(deg%+deg inc%)MOD360
280 DRAW FNx,FNy
290 ENDPROC
```
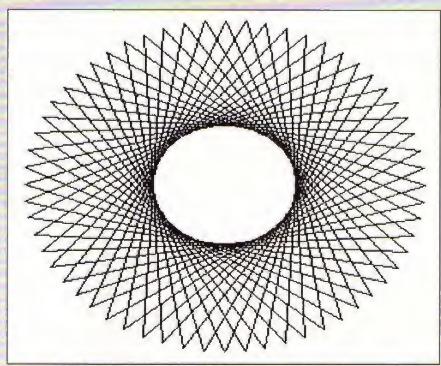

Figure I: The basic sunburst pattern produced by the listing on the left

```
10 REM Sunburst II
20 REM By John Geraghty
30 REM (c) Electron User
40 :
50 T$="SUNBURST"
60 ON ERROR PROCerr
70 IF PAGE>&E00 PROCreloc
80 MODE5
90 DIM vdu% 362*5
100 PROCinit
110 MODE2
120 PROCtitle
130 :
140 REPEAT
150 PROCpattern
160 PROCfx
170 UNTIL FALSE
180 :
190 DEF PROCinit
200 *FX9,0
210 *FX16
220 I%=TRUE
230 PROCassemble
240 PROCpat init
250 VDU23,1,0;0;0;0;29,640;512;
23,240,240,240,240,240,0;19,0,3
;0;19,2,1;0;
260 COLOUR2:PRINTTAB(6,24)"Hold
on..."
270 ?c1=240:?c2=240
280 L%=0
290 REPEAT
300 L%=L%+1:IF L%=6 L%=0:CALL r
nd col
310 UNTIL FNpoint
320 dummy=FNpoint+FNpoint
330 ENDPROC
340 :
350 DEF PROCpat init
360 READ n%,deg inc%
370 IF n%=999 RESTORE:GOTO360
380 cosi=COSRADdeg inc%
390 sini=SINRADdeg inc%
400 old cosi=1:old sini=0
410 cosn=COSRAD(deg inc%*n%)
420 sinn=SINRAD(deg inc%*n%)
430 old cosn=1:old sinn=0
440 R%=800:y%=R%:x%=0
450 vdu ind%=vdu%-5
```
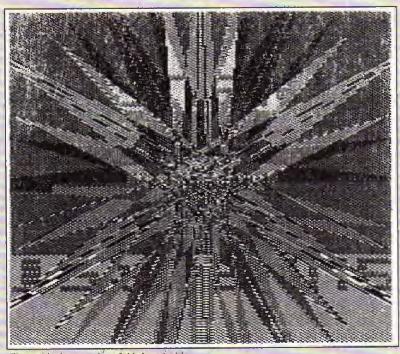
```
460 ENDPROC
470 :
480 DEF FNpoint
490 vdu ind%=vdu ind%+5
500 IF R%>700 !vdu ind%=7 ELSE
!vdu ind%=R%*13B DIV100 MOD7+1
510 !(vdu ind%+1)=&10000*y%+x%
520 ncos=old cosn*cosn-old sinn
*sinn
530 old sinn=old sinn*cosn+old
cosn*sinn
540 old cosn=ncos
550 R%=800*ncos
560 cos=old cosi*cosi-old sini*
sini
570 old sini=old sini*cosi+old
cosi*sini
580 old cosi=cos
590 x%=R%*old sini:y%=R%*cos
600 =(y%>796 AND x%=0)
610 :
620 DEF PROCtitle
630 ?&FE07=48
640 GCOL0,128+8
650 VDU24,0;296;1271;724;;CLG:V
DU26
660 GCOL0,8
670 VDU5
680 A%=10:X%=&70:Y%=0
690 FOR char%=1 TO LENT$
700 ?&70=ASCMID$(T$,char%,1)
710 CALL osword
720 ?&72=?&71:?&76=?&77
730 IF char%=6 ?&74=?&74-4
740 :
750 FOR L%=1 TO 5
760 byte%=?(&71+L%)
770 vpos%=852-L%*20
780 pos%=(char%-1)*164
790 FOR I%=pos% TO pos%+120 STE
P32
800 byte%=byte%*2
810 IF byte% AND 64 MOVEI%,vpos
%:VDU240:MOVEI%,vpos%-552:VDU240
820 NEXT:NEXT
830 VDU29,640;512;
840 ?&FE07=16
850 ENDPROC
860 :
```

```
870 DEF PROCpattern
880 FOR C%=0 TO 7:VDU19,C%,0;0;
19,C%+8,C%+8,0;0;:NEXT
890 IF I% I%=FALSE ELSE Y%=0:CA
LL shut col
900 !vdu start=vdu%:!vdu end=vd
u ind%+5
910 CALL pattern
920 MOVE-150,-80:MOVE150,-80:PL
0T85,0,150
930 GCOL0,1
940 MOVE-150,-80:DRAW150,-80:DR
AW0,150:DRAW-150,-80
950 Y%=-1:X%=49:CALL colour
960 ENDPROC
970 :
980 DEF PROCfx
990 PROCpat init
1000 delay=FALSE
1010 title%=TRUE
1020 TIME=3000
1030 REPEAT
1040 act%=RND(8+title%)-(1+title
%)
1050 :
1060 FOR C%=-title% TO 7
1070 IF delay IF n%=222 IF C%<6
FOR d=0 TO 100:NEXT:GOTO1090
1080 IF delay IF FNpoint dummy=F
Npoint+FNpoint:C%=7:NEXT:UNTIL TR
UE:ENDPROC
1090 IF RND(100)>98 delay=NOT de
lay
1100 :
1110 ?pb=C%+8:?(pb+1)=C%+8
1120 A%=title%:CALL palette
1130 IF delay FOR d=0 TO 30:NEXT
1140 ?pb=RND(8)+7:?(pb+1)=act%+8
1150 A%=title%:CALL palette
1160 NEXT
1170 :
1180 IF TIME>3500 title%=FALSE:T
IME=0
1190 IF TIME>3000 IF title%=FALS
E title%=TRUE:FOR C%=0 TO 7:FOR d
=0 TO 100:NEXT:VDU19,C%,0;0;:NEXT
                                ▶
```

The multicolour version of this is stunning

```
    :VDU19,8,7;0;
1200 IF RND(10)>5 UNTIL FALSE
1210 YZ=RND(4)-2:XZ=RND(63)
1220 IF YZ<2 CALL colour ELSE IF
NOT titleZ IF TIME>5 CALL colour
1230 UNTIL FALSE
1240 :
1250 DEF PROCassemble
1260 screen=&70:col addr=&72:tem
p=&74
1270 rows=&75:rnd=&76:c1=&77
1280 c2=&78:vdu start=&79:vdu en
d=&7B
1290 scr hi=&34E:osword=&FFF1
1300 osbyte=&FFF4:oswrch=&FFEE
1310 :
1320 FOR pass=0 TO 2 STEP2
1330 PZ=&A00
1340 [OPT pass
1350 .colour
1360 JSR super pix:TYA:BEQ norm
col
1370 BMI rnd col:CMP #1:BEQ jmp
1380 JMP scroll col:.jmp JMP shu
t col
1390 :
1400 .norm col
1410 LDA #0:STA screen:LDA scr h
i
1420 STA screen+1:LDY #0
1430 .nloop
1440 LDA c1:EOR (screen),Y
1450 STA (screen),Y:INY:LDA c2
1460 EOR (screen),Y:STA (screen)
,Y
1470 INY:BNE nloop:INC screen+1
1480 BPL nloop:RTS
1490 :
1500 .rnd col
1510 LDX #0
1520 .rloop1
1530 LDA #0:STA screen:STA scree
n+1
1540 LDY #3:LDA rnd
1550 .rloop2
1560 ASL A:ROL screen+1:DEY
1570 BNE rloop2:STA screen
1580 LDA scr hi:CLC:ADC screen+1
1590 STA screen+1
1600 .rloop3
1610 LDY #7
1620 .rloop4
1630 TYA:AND #1:BEQ rover
1640 LDA c2:JMP rover2
1650 .rover
1660 LDA c1
1670 .rover2
1680 EOR (screen),Y:STA (screen)
,Y:DEY
1690 BPL rloop4:LDA screen+1:CLC
1700 ADC #8:STA screen+1:BPL rlo
op3
1710 LDA rnd:ASL A:ASL A:CLC
1720 ADC rnd:CLC:ADC #3:STA rnd
1730 DEX:BNE rloop1:RTS
1740 :
1750 .shut col
1760 STY temp:LDX #7:LDY #0
1770 .sloop1
1780 STX screen:LDA scr hi:STA s
creen+1
1790 .sloop2
1800 TXA:AND #1:TAY:LDA c1,Y
1810 LDY temp:BNE not title
1820 LDA #&C0:AND (screen),Y
1830 JMP restore title
1840 .not title DEY:EOR (screen)
,Y
1850 .restore title
1860 STA (screen),Y:LDA screen:C
LC
1870 ADC #8:STA screen
1880 BCC sloop2:INC screen+1
1890 BPL sloop2:DEX:BPL sloop1
1900 RTS
1910 :
1920 .scroll col
1930 LDX #&20:STX rows:LDX #0
1940 STX screen:LDX scr hi:STX s
creen+1
1950 .scrow
1960 LDA screen:STA col addr:CLC
1970 ADC #&80:STA screen:LDA scr
een+1
1980 STA col addr+1:ADC #&02
1990 BPL scover:LDA #&30
2000 .scover
2010 STA screen+1:LDA #&13:JSR o
sbyte
2020 LDA screen+1:LSR A:ROR scre
en
2030 TAY:LDX #3:LDA #&97:JSR osb
yte
2040 LDA screen:ASL screen:TAY
2050 LDX #2:STX temp
2060 LDA #&97:JSR osbyte
2070 LDY #0:LDX #&40
2080 .scloop
2090 LDA (col addr),Y:EOR c1
2100 STA (col addr),Y:INY
2110 LDA (col addr),Y:EOR c2
2120 STA (col addr),Y:INY
2130 BNE sc hi ok:INC col addr+1
2140 .sc hi ok
2150 DEX:BNE scloop
2160 DEC temp:BNE scloop
2170 .row end
2180 DEC rows:BNE scrow:RTS
2190 :
2200 .super pix
2210 STX c1:TXA:AND #85
2220 ASL A:STA c2:TXA
2230 AND #170:LSR A:ORA c2
2240 STA c2:RTS
2250 :
2260 .pattern
2270 LDX #2:LDY #0
2280 .ploop
2290 LDA #ff:BMI pout
2300 LDA #&12:JSR oswrch:LDA #&0
3
2310 JSR oswrch:JSR read vdu
2320 LDA #&19:JSR oswrch
2330 TXA:BEQ tri:DEX:LDA #&04
2340 BNE plot opt
2350 .tri
2360 LDA #85
2370 .plot opt
2380 JSR oswrch:JSR read vdu
2390 JSR read vdu:JSR read vdu
2400 JSR read vdu:LDA vdu start
2410 CMP vdu end:BNE ploop
2420 LDA vdu start+1:CMP vdu end
+1
2430 BNE ploop:.pout RTS
2440 :
2450 .read vdu
2460 LDA (vdu start),Y:JSR oswrc
h
2470 INC vdu start:BNE rend
2480 INC vdu start+1:.rend RTS
2490 :
2500 .palette
2510 PHA:LDA #&13:JSR osbyte
2520 JSR osw12:PLA:BNE rend
2530 .fore too
2540 LDA pb:SEC:SBC #8:STA pb
2550 LDA pb+1:SBC #8:STA pb+1
2560 .osw12
2570 LDA #&0C:LDX #pb MOD&100
2580 LDY #pb DIV&100:JMP osword
2590 :
2600 .pb
2610 EQUD 0
2620 EQUB 0
2630 ]:NEXT:ENDPROC
2640 :
2650 DEF PROCreloc
2660 OSCLI("KEY0 *TAPE▪FZ=PAGE
:TZ=&E00:↑TOP=13:REPEAT ?TZ=?FZ:L
Z=LENSTZ+1:TZ=TZ+LZ:FZ=FZ+LZ:UNTI
L FZ>TOPM PAGE=&E00M OLDM RUN
M"):OSCLI("FX138,0,128"):END
2670 :
2680 DEF PROCerr
2690 ON ERROR OFF
2700 *FX9,25
2710 VDU22,6:HIMEM=&6000
2720 PRINT':REPORT:PRINT " at li
ne ";ERL
2730 :
2740 DATA 222,6,264,11,330,13,34
2,14,24,14,320,13,999,999
```

THE Electron is now well into its seventh year, having been released way back in autumn 1983. So long ago in fact, that some of our youngest readers might not have been been born! Ageing whizz kids like me however, can remember those heady days when the Electron was King. Those were the days. In retrospect the past always seems rosy as memories dim and events get muddled in our minds. What was really happening five years ago this month?

"Electron heads for success in 1985" proclaimed the headlines in *Electron User's* news pages. The lead story went on to say that "Excellent Christmas sales of the Electron are being seen as an indication the machine could become the big computer success story of 1985". W.H. Smiths reported: "The sales rate for the Electron has almost tripled in a few weeks".

The Plus 3 ADFS disc system had just been released for £229 and also an RS423 interface was announced – but that piece of hardware never materialised. And what happend to the doomed Plus 2 Econet interface demonstrated by Acorn at shows?

Acornsoft announced the release of ISO-Pascal, one of the most important pro-

gramming languages currently in use, and Logo was on the way. Skywave was also selling the cult programming language Forth, on a rom chip.

Latest releases on the software scene were Warp 1 from Icon, Stranded from Superior, Bumble Bee and Ghouls from Micropower and Pinball Arcade from Kansas City Systems.

Phi Mag Systems announced a Phloopy super fast tape system that emulated a disc

Barry Woods takes a trip down memory lane

system, but was really a cassette. One spent a few weeks attached to my micro and I thoroughly enjoyed it. However, it soon broke down, the Phloopy idea never really caught the public's imagination, and Phi Mag Systems eventually disappeared.

Voltmace was selling its Delta 3B joystick – it still is – and Qual-Soft was boasting that Soccer Supremo was "Not so much a game, more a way of life". It has been updated and is now called Rome '90 – the adverts are still running in *Electron User*. And Superior Software was there on the inside back page with Overdrive and Smash and Grab.

Electron User's cover featured a superb pie chart generator from the talented Jon Willington (the listing can be found in this month's In Action feature). Pete Bibby was up to Part 12 of his Introduction to Programming, and Merlin was providing the adventure hints and tips. A relatively unknown newcomer, Roland Waddilove, provided a machine code shoot-'em-up, while Dave Robinson's utility displayed New Year greetings cards.

● *It is interesting to see how some names have come and gone, but others are still with us. Next month I'll time warp back to 1984 – can you remember what was happening in February that year?*

TIME WARP 1985

Don't miss out on the mass of material that's appeared in *Electron User* over the past few months. Bring yourself up to date with this back issue bundle, packed with games, utilities, features and programming tutorials.

Here's what you'll find in the
June 1989 – November 1989 bundle:

July 1989 issue:
Games: Jet Bike arcade adventure, educational fun with Ladder Adder, Time bomb arcade fun. *Utilities:* Speedy Reader. *Reviews:* Predator, Stormcycle, Sam 8. *Features:* Jafa Systems interview, Disc error codes documented, 10 Liners, Philosophers Quest and Palace of Magic mapped.

August 1989 issue:
Games: Rollerball, Bingo. *Reviews:* Alps, Turtle Worlds, White Magic, Play it Again Sam 9. *Features:* Map of Kayleth, Repton Infinity tips. *Utilities:* Disc Housekeeper, Mode 2 screen compacter, Titration, Chemical Equations.

September 1989 issue:
Game: Snakes. *Reviews:* Keyword, Basic Editor Plus, Ballistix, Sam 10. *Features:* Arcade Corner, Electron history. *Utilities:* Attribute editor, magazine database.

October 1989 issue:
Game: Spinning frustration, Jet Bike, Robokill. *Reviews:* Rodeo Games, Hi Q Quiz, Spooksville, Rombard. *Features:* Exile solution, Electron carrying case. *Utilities:* Elkpaint, Disc Menu.

November 1989 issue:
Game: Storker's Run, Shopping Spree, Dollar Dash, Octavia. *Reviews:* Ardcade Soccer, White Magic 2, Citizen printer. *Features:* Exile solution, Flowcharts, buyer's guide to printers. *Utilities:* Scroller.

December 1989 issue:
Games: Wishing Wells. *Reviews:* Ricochet, Play It Again Sam II, System 80, Superior Soccer, Sign Writer, Time Lines. *Features:* Ravenskull solution, American Suds map, Break key protector. *Utilities:* Word square solver, screen faser, calendar maker, extended renumber.

electron user

BACK ISSUE BUNDLE

Everything you ever wanted to know about your Electron but were afraid to ask is in these back issues of Electron User

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TO ORDER PLEASE USE THE FORM ON PAGE 45

B ERTIE BOUNCE is a bright sky blue rubber ball and unfortunately he has become lost. In this vertically scrolling arcade game – a rarity on the Electron – your task is to guide him back home.

The path you take is made up of small blocks, some of which can be rolled over while others must be bounced over as they will destroy Bertie. You may find that rolling on to one type of block makes Bertie stick to the spot, while another makes him bounce high into the air. Some make him appear to be drunk and you lose control of his actions for a few seconds.

The program is written in Basic, but despite this it runs extremely quickly – you won't need your Turbo switched on for this game. In fact, an extra line has been added to slow down the frantic action:

```
320 FOR DELAY=1 TO 200:NEXT
```

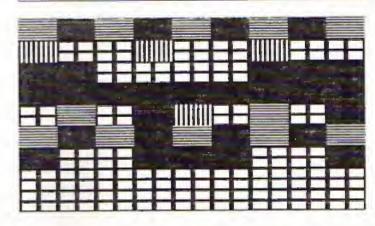If you still find the game too difficult increase the delay loop to 300 or 400. If it is too easy reduce it to 100 or 50.

BOING!

Nicholas Darwin bounces on to your screen with an unusual arcade game

CONTROLS	
Z	Left}
X	Right
Space	Bounce

```
   10 REM Bounce
   20 REM By Nicholas Darwin
   30 REM (c) Electron User
   40 MODE 5
   50 VDU 23,1,0;0;0;0;
   60 GOSUB 700
   70 REV=0
   80 VDU 23,240,255,129,129,129,
129,129,129,255
   90 GOTO 110
  100 VDU 23,240,0,0,252,4,4,228,
36,36
  110 VDU 23,224,255,255,255,255,
255,255,255,255
  120 VDU 23,225,255,0,255,0,255,
0,255,0
  130 VDU 23,226,85,170,85,170,85
,170,85,170
  140 VDU 23,227,85,85,85,85,85,8
5,85,85
  150 VDU 23,241,255,255,129,137,129,
137,129,137,255
  160 VDU 23,242,126,188,216,224,
224,216,188,126
  170 REM VDU 23,240,0,0,0,0,0,0,
0,0
  180 VDU 23,228,0,0,0,24,24,0,0,
0
  190 VDU 23,229,0,0,60,126,126,1
26,60,0
  200 VDU 23,230,60,126,255,255,2
55,255,126,60
  210 PROCstart_up
  220 VDU 19,1,6;0;
  230 FL=1
  240 STI=0
  250 X=10
  260 ZX=0
  270 FLA=0
  280 E=0:F=0
  290 HI=0
  300 CO=0
  310 ZX=X
  320 FOR DELAY=1 TO 200:NEXT
  330 IF CO=324 END
  340 STI=STI-1
  350 IF STI<0 STI=0
  360 F=E
  370 IF FLA=1 HI=HI+1:IF HI>1 FL
A=2:GOTO 390
  380 IF FLA=2 HI=HI-1:IF HI=0 FL
```

```
A=0:SOUND 0,-15,4,1
  390 IF REV=1 THEN 430
  400 IF INKEY(-98) AND HI=0 X=X-
1:IF X<1 X=1
  410 IF INKEY(-67) AND HI=0 X=X+
1:IF X>18 X=18
  420 GOTO 450
  430 IF INKEY(-67) AND HI=0 X=X-
1:IF X<1 X=1
  440 IF INKEY(-98) AND HI=0 X=X+
1:IF X>18 X=18
  450 REM
  460 IF INKEY(-99) AND HI=0 AND
STI=0 THEN FLA=1
  470 E=ASC FNreadcharacter(X,19)
  480 IF FL=1 C=LE(1,CO):CO=CO+1:
FL=2 ELSE FL=1
  490 COLOUR 2:PRINT TAB(1,0);A$(
C)
  500 PRINT TAB(0,0);:VDU 11
  510 IF CHR$ E=CHR$ 146 GOTO1420
  520 IF HI>0 GOTO 580
  530 IF CHR$ E=CHR$ 128 GOTO1420
  540 IF CHR$ E=CHR$ 129 HI=0:FLA
=1
  550 IF CHR$ E=CHR$ 130 STI=35
  560 IF CHR$ E=CHR$ 131 AND REV=
1 REV=0:SOUND 1,-15,120,1:GOTO 58
0
  570 IF CHR$ E=CHR$ 131 AND REV=
0 REV=1:SOUND 1,-15,120,1
  580 REM
  590 COLOUR2:PRINT TAB(ZX,21);CH
R$ F:COLOUR1:PRINT TAB(X,20);CHR$
(228+HI)
  600 VDU4
  610 GOTO 310
  620 REM *****************
  630 DEF FNreadcharacter(cX,rX)
  640 XX=POS:YX=VPOS
  650 VDU 31,cX,rX
  660 AX=135
  670 CX=(USR(&FFF4) AND &FF00) D
IV &100
  680 VDU 31,cX,rX
  690 =CHR$CX
  700 M$=CHR$ 224+CHR$ 224:N$=CHR
$ 225+CHR$ 225:O$=CHR$ 226+CHR$ 2
26:P$=CHR$ 227+CHR$ 227:Q$=CHR$ 2
40+CHR$ 240:R$=CHR$ 242+CHR$ 242
  710 DIM A$(25),LE(1,330)
```

```
  720 A$(1)=Q$+Q$+M$+M$+M$+M$+M$+
Q$+Q$
  730 A$(2)=N$+M$+M$+M$+M$+M$+N$+
M$+N$
  740 A$(3)=M$+M$+M$+Q$+Q$+Q$+Q$+
M$+M$
  750 A$(12)=Q$+Q$+Q$+Q$+Q$+Q$+Q$
+Q$+Q$
  760 A$(4)=M$+M$+M$+M$+M$+M$+M$+
M$+M$
  770 A$(5)=Q$+Q$+P$+Q$+Q$+P$+Q$+
Q$+P$
  780 A$(6)=M$+Q$+N$+Q$+P$+M$+Q$+
N$+Q$
  790 A$(7)=Q$+Q$+Q$+Q$+M$+Q$+Q$+
Q$+Q$
  800 A$(8)=Q$+Q$+Q$+M$+M$+M$+Q$+
Q$+M$
  810 A$(9)=Q$+Q$+Q$+Q$+Q$+Q$+Q$+
Q$+Q$
  820 A$(10)=Q$+Q$+Q$+Q$+M$+M$+M$
+M$+M$
  830 A$(11)=M$+M$+M$+M$+M$+Q$+Q$
+Q$+Q$
  840 A$(13)=N$+N$+N$+N$+N$+N$+N$
+N$+N$
  850 A$(14)=M$+M$+M$+M$+Q$+M$+M$
+M$+M$
  860 A$(15)=Q$+Q$+Q$+Q$+Q$+Q$+Q$
+Q$+Q$
  870 A$(16)=Q$+Q$+Q$+M$+Q$+Q$+Q$
+Q$+Q$
  880 A$(17)=Q$+Q$+Q$+R$+R$+R$+R$
+R$+R$
  890 A$(18)=R$+R$+R$+R$+R$+R$+Q$
+Q$+Q$
  900 A$(19)=Q$+Q$+Q$+R$+R$+R$+Q$
+Q$+Q$
  910 A$(20)=R$+R$+R$+Q$+Q$+Q$+Q$
+R$+R$
  920 A$(21)=R$+Q$+R$+Q$+R$+Q$+R$
+Q$+Q$
  930 A$(22)=Q$+R$+Q$+R$+Q$+R$+Q$
+R$+Q$
  940 A$(23)=M$+M$+M$+M$+Q$+M$+M$
+M$+M$
  950 A$(24)=CHR$240+CHR$240+CHR$
240+"***FINISH***"+CHR$240+CHR$24
0+CHR$240
```

➤

```
 960 FOR A=1 TO 330
 970 READ LE(1,A)
 980 NEXT
 990 DATA 1,9,1,9,9,2,5,3,4,6,2,
8,9,9,9,9,9,10,9,9,9,9,11,9,4,12,1,9,
9,9,3,3,4,6,13,14,9,9,13,14,9,9,3
,3,3,9,9,1,1,8,9,9,9,9,1,1,12,15,15
,9,9,1,1,15,9,9,3,3,9,9,9
1000 DATA 16,4,9,9,12,12,11,11,9
,9,9,10,10,9,9,9,1,1,4,9,9,4,9,9,
4,9,9,5,6,7,4,9,9,6,5,9,3,2,1
1010 DATA 9,9,8,1,8,1,1,8,8,10,9
,9,11,9,9,5,9,6,1,9,9,10,9,9,8,8,
10,10,9,9,4,1,9,9,9,4,9,9,11,
11,9,9,9,10,10,4
1020 DATA 9,9,20,9,9,9,19,9,9,4,
9,9,18,9,9,9,17,9,9,15,9,9,4,7,
8,9,9,10,19,6,9,4,5,9,9
1030 DATA 1,9,2,9,9,3,9,9,12,5,8
,9,9,20,4,22,9,21,9,22,9,21,9,4,9
,9,4,9,4,9,11,9,9,9,22,9,22,9,21
,9,22,9,21,9,21,9,22,9,22,9,22,9,2
1,9,22,9,21,9,22,9,9,4,9,4,9,9,4,
9,9,9,9,9,9,2,22
1040 DATA 15,15,9,9,9,9,9,9,23,9
,9,9,19,3,9,22,9,9,21,16,9,9,4,1,
12,9,5,9,8,11
1050 DATA 9,9,9,9,9,9,9,9,9,9,9,
9,9,9,9,9,9,9,9,9,24,9,9,9,9,9,9,
9,9,9,9,9,9,9,9
1060 RETURN
1070 DEF PROCstart up
1080 COLOUR 3
1090 CLS
1100 GCOL 0,1
1110 X=500:Y=500:R=200
1120 MOVEX,Y+R
1130 FOR I=0 TO 2*PI STEP PI/10
1140 DRAW X+R*SINI,Y+R*COSI
1150 NEXT
1160 FOR A=1 TO19
1170 PRINT TAB(A,1);CHR$225
1180 PRINT TAB(A,29);CHR$225

1190 NEXT
1200 FOR A=1 TO 29
1210 PRINT TAB(1,A);CHR$227
1220 PRINT TAB(19,A);CHR$227
1230 NEXT
1240 PRINT TAB(6,14);CHR$229+CHR
$32+CHR$229
1250 MOVE 450,450
1260 DRAW 550,450
1270 DRAW 520,420
1280 DRAW480,420
1290 DRAW450,450
1300 GCOL 0,2
1310 PRINT TAB(2,28);"I-Inst. S-
start"
1320 MOVE 280,900:DRAW 280,800:D
RAW 320,850:DRAW 280,900:DRAW 280
,850:DRAW 320,850
1330 MOVE 380,900:DRAW 350,850:D
RAW 380,800:DRAW 410,850:DRAW 380
,900
1340 MOVE 440,900:DRAW 440,800:M
OVE 470,800:DRAW 470,900:DRAW 510
,800:DRAW510,900
1350 MOVE 560,900:DRAW 540,850:D
RAW560,800:DRAW 580,850:DRAW 570,
850:DRAW590,850
1360 SOUND 1,-15,120,3:SOUND 1,-
15,110,3:SOUND 1,-15,120,3:SOUND
1,-15,110,3
1370 SOUND 1,-15,120,3:SOUND 1,-
15,110,3:SOUND 1,-15,120,3
1380 SOUND 1,-15,60,3:SOUND 1,-1
5,50,3:SOUND 1,-15,60,3:SOUND 1,-
15,50,3:SOUND 1,-15,60,3
1390 SOUND 1,-15,50,3:SOUND 1,-1
5,60,3:SOUND 1,-15,50,3:SOUND 1,-
15,60,3:SOUND 1,-15,60,3:SOUND 1,
-15,70,3:SOUND 1,-15,60,3:SOUND 1
,-15,65,3
1400 k$=INKEY$0:IF k$="I" PROCin
struct:GOTO1070
1410 IF k$="S" CLS:ENDPROC ELSE
GOTO 1400

1420 CLS
1430 TT=(CO/324)*100
1440 PRINT TAB(4,8);"Oh dear!"
1450 PRINT TAB(2,12);"Completed
";INT(TT);"%"
1460 IF TT<30 COLOUR1:PRINT TAB(
4,18);"RUBBISH!!" ELSE IF TT<60 C
OLOUR 2:PRINT TAB(4,18);"PUNY!!"
ELSE IF TT<80 COLOUR3:PRINT TAB(4
,18);"OKAY" ELSE IF TT<100 COLOUR
1:PRINT TAB(4,18);"NOT BAD!"
1470 SOUND 1,-15,60,2
1480 SOUND 1,-15,64,4
1490 FOR T=60 TO 40 STEP -5
1500 SOUND 1,-15,T,3
1510 NEXT
1520 FOR G=1 TO 2000:NEXT
1530 GOTO 70
1540 DEF PROCinstruct
1550 VDU22,4:PRINTTAB(10,2);"INS
TRUCTIONS"
1560 PRINT TAB(0,5)"You control
Bertie Bounce, the little":PRINT:
PRINT"blue ball. He decided to ta
ke a short":PRINT:PRINT"cut home
through concrete city, but"
1570 PRINT:PRINT"unfortunately,
he forgot it was a":PRINT:PRINT"d
angerous place"
1580 PRINT:PRINT"Can you get him
 home?":PRINT:PRINT"I doubt it!"
1590 GO=GET:VDU22,5:PRINT
1600 PRINT "Special blocks...":P
RINT'CHR$224;" needs to be jumped
":PRINT'CHR$225;" makes you jump"
:PRINT'CHR$226;" makes you sticky
":PRINT'CHR$227;" makes you drunk
!":PRINT'CHR$242;" is unjumpable"
1610 PRINT:PRINT"Z=Left  X=Right
"
1620 PRINT"Space=Jump":PRINT:PRI
NT"By N.Darwin"
1630 GO=GET:CLS
1640 ENDPROC
```

The mains way to communicate

Grahame Cohen is a real live wire using the Verran AC Datalink

COMMUNICATING through the mains is nothing new. For a number of years now intercoms have been available which plug into ordinary three pin wall sockets using the AC ring main to transmit information. However, this was only possible because the signal was clear enough for us humans to understand, even if a little interference was encountered.

Computers require more accuracy and the ring main is hardly an ideal environment, although convenient, to send data as it is prone to voltage spikes, surges, fluctuations and interference.

The Verran AC Datalink has been designed to cope with all these problems by transmitting packets of information using frequency modulation (FM) which is bandwidth efficient and resistant to noise. This, combined with error detection of each packet of data, prevents almost 100 per cent of all errors.

The AC Datalink cuts out the need for extensive cabling. It can transmit and receive either parallel Centronics or serial RS232 standards, which means it is compatible with nearly all computers and can be used for shared connection to printers, plotters, modems or other computers with appropriate communications software.

The Datalink is solidly constructed in black plastic, with 11 LEDs vertically aligned on the semi-circular front. Lifting a flap at the rear of the unit reveals a power socket, a thoughtful inclusion to reduce the need for mains adaptors. Below the socket are two rows of DIP switches to configure the unit to suit most peripherals.

Two cables of generous length run from the back of the unit, one plugs into a wall socket for power and data transmission, the other has a male RS232 connector. Also supplied are three adaptors – an RS232 gender changer, Datalink to Centronics and Datalink to parallel port. These connect to the male RS232 lead and between them will allow connection to most peripherals and computers. The unit itself is fairly small in size and will sit neatly on the floor or by the side of the peripheral.

Each Datalink is individually boxed with its own well written and concise manual. You do, of course, need two – one unit must connect to the computer and the other to the peripheral. As you increase the number of Datalinks on a single ring main a fall off in performance is experienced. Verran recommends up to five pairs per ring main.

In practice it is possible to have many more, as a fall off in performance only occurs when all five are transmitting at the same time, which is unlikely, especially if you are sharing less than five peripherals.

For instance, 10 Electrons can share two printers. In this situation each would be given a separate address by use of the DIP switches. In order to send data to a printer you select its address on the Datalink attached to the computer. This means that switching from one peripheral to another involves fiddling with DIP switches, tedious if you often swap over.

Another problem is that of queueing. If two computer operators decide to send data to the printer at the same time, all the data will arrive simultaneously and the machine will consequently print garbage. You must check that the printer is not in use before printing. The more machines connected in the network the more confusing this can become.

Setting up the Verran Datalink is quick and easy – it took me under 15 minutes. First I moved my printer to another room and attached a Datalink to both Electron and printer, configured the DIP switches and then sent a screen dump across via ring main.

It was exciting hearing the printer jump into action as I remotely controlled it. The screen dump was perfect – the Datalink certainly works well. Information is transmitted at about 800 characters per second (16000 baud). That's roughly an A4 page every three seconds – certainly fast enough for any printer.

If Datalink is used in an office where confidential information may be transmitted it would be easy for unauthorised persons to tap into it with a similar Datalink. To prevent this you can set a security code of up to four million combinations using the DIP switches.

Another very useful Datalink function is that of standards conversion. If, for instance, you had a serial printer and you wanted to control it from your Centronics port, no problem

Simply configure the Datalink on the printer end to transmit to the printer in serial standard. This has great advantages, as it ensures compatibility between almost any pair of machines you have or are likely to acquire.

For ad-hoc cabling the Datalink certainly captures the market. Just imagine how much easier it makes exhibitions and demonstrations. No need for expensive temporary cabling and it is also much more flexible, giving you the ability to change a display without rewiring. When the exhibition is over simply unplug and go.

Datalink has been primarily designed for office and business use. Despite its high price of £201.25 I am sure some will find their way into homes and schools, especially if there is little space or more than one computer, or if a wife banishes a noisy printer to the cupboard under the stairs.

The AC Datalink cannot replace traditional cabling, particularly when it involves a large number of permanent machines, but if you require to set up a network quickly, or if office moves are expected, it would no doubt be a cost effective and convenient solution.

Adventures
By Pendragon

THE snow is falling heavily on the castle battlements and the cave is freezing once again – who cracked that joke about global warming? I sit here contented under the ghost of Merlin, and enter the fourth year of writing these epistles to you. The quill may be worn, but my heart is strong and my Electron sturdy. What a year this promises to be.

Now is the time to work hard at solving those adventures that for so many moons have gathered dust on my cobwebbed shelves. Among the rogues that I have neglected – either through overwork or complexity of the animal – are **Red Moon**, **Quondam**, **The Seventh Star**, **Island of Xaan** and **Gateway to Karos**.

You will no doubt immediately notice three Acornsoft titles there. Thanks to a massive reader response to my plea last month, I am now making enormous headway through Gateway to Karos and hope to have a solution for you very soon.

In the meantime a few timely tips might help other wayfarers who may be stuck in this glorious adventure: To read the ancient book, ensure you are wearing the iron circlet. Get the axe from the woodcutter's hut to cleave a way through the undergrowth.

Put the plank across the pit in the passage to journey further, but also ensure that you have broken the big jar with the hammer. Remove your armour to lighten your load if the ladder keeps breaking when you climb it in the cave. To avoid being shipwrecked sail parallel to the coast and look carefully at each location.

Quondam is a very different beast and I am fast revising my opinion that **Ferryman Awaits** is the most difficult adventure on the Electron. Has anyone finished Quondam?

It is a standard treasure collecting affair set in a magical medieval land. But the adventure is full of traps and very complex, apparently illogical puzzles.

Despite the fact that the game is driving me to distraction it is an excellent jaunt and will keep any quester glued to his Electron for hours. It therefore puzzles me that as part of Topologika's wholesale recoding of old Acornsoft adventures, they have not chosen to re-release this one.

Now is also the time to enjoy the more recent offerings, and I have had a most pleasant month wandering through Topologika's **Avon** and **Murdac**, battling against Captain Lizard in **Blood of the Mutineers** and trying to solve the **Mathews Murders**. All are firmly in the top flight of Electron adventures and if you are looking for a new quest you won't go far wrong with any of them.

I am most impressed with Avon and must congratulate Topologika for breathing new life into the Electron, by not only releasing all the Acornsoft conversions but also by writing brilliant new adventures like Avon and Murdac for our machine.

When you consider that you have the choice of the entire Robico, Topologika, Acornsoft and Epic stables, the adventuring world really is an Electron user's oyster. If you happen to have a Slogger Master Ram board fitted to your Electron, the number of BBC Micro adventures you can play becomes enormous.

Staying with the Acornsoft theme, this month's featured map is of the opening scenario to **Kingdom of Hamil**. This should relieve adventurers who may still be stuck at the outset of this real teaser of a game.

Next month I continue this popular series with a guide to the openings to Kansas City's **Ring of Time**. That's it for now, so until the Reaper calls again, happy adventuring.

Dusting off the cobwebs

Readers Hall of Fame

Continuing from Star-room 1, drop everything, take the lamp and turn it off, SAY ZOOGE and turn it on again. Return to the slab, take the paint, bottle and pot. Now go to the ningy room, take the ningy and rod. Go to REMBR, turn the lamp off, take the paint, SAY ZOOGE, drop the paint and turn the lamp on again.

Now comes a comical, but difficult part of the game. Go to the cliff and drink the gin, then jump, jump again and go out into the desert – it was dry gin you see.

Drop the rod and pot, and go to the oasis.

Once there, climb the tree, jump, collect the skull and take everything. Now return, collecting the perfume and vial and using the barrel to transport the water.

Take the rod and pot back to the slab room, drop both and fill the bottle. Now journey to Star-room 2 and drop the perfume, vial and rug, then turn the lamp off, SAY ZOOGE and turn it on again.

Go back to the slab, take the matches, keys and pillow and get ready for a bit of travelling. Go West, West, West, North, East, Down, take the wine and go UP.
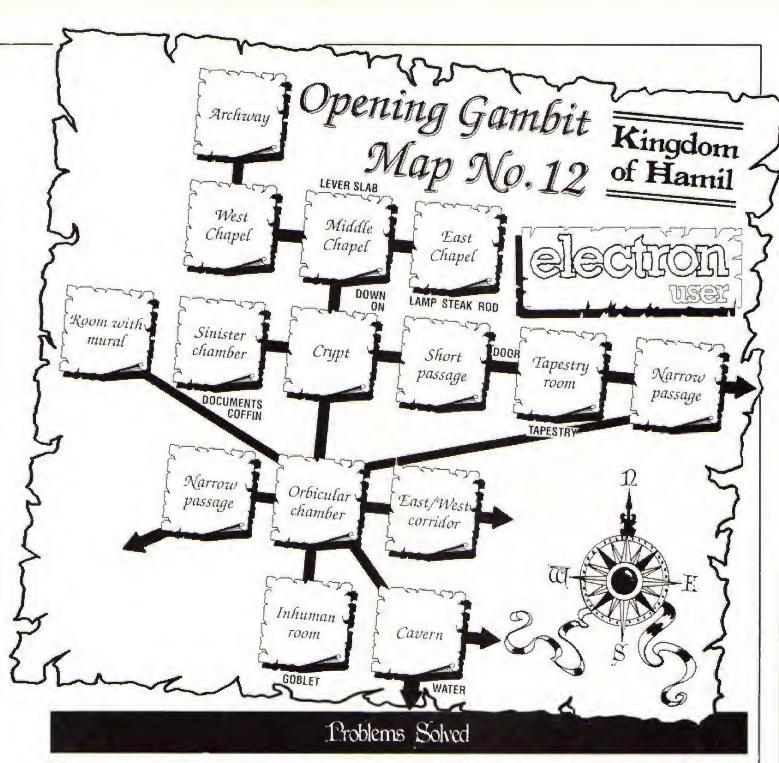
Travel West, West and take the clock. Go Up, North-West, drop the wine, then continue North-West, West, enter the maze, take the horn and leave. Go North, turn the lamp off, go South-West then drop the pillow and clock. Continue East, East, North, East and water the plant.

Go South, West and In, take the herbs and go Out. Venture West, West, South, South, East, West, South, West and take what you find there.

Now journey East, North, East, North; light the match then light the maze, drop the match, go South, South, take what you find and return North, North, North, North, North. Turn the lamp on and go South, South-East then turn the lamp off.

Drop the fleece, turban, spice and horn. Turn the lamp off once more, SAY ZOOGE and finally turn the lamp on again.

(Continued next month)

Opening Gambit Map No. 12

Kingdom of Hamil

electron user

Map rooms (as labelled):

- Archway
- West Chapel
- Middle Chapel — LEVER SLAB
- East Chapel
- Room with mural
- Sinister chamber — DOCUMENTS COFFIN
- Crypt — DOWN ON
- Short passage
- Tapestry room — DOOR
- Narrow passage
- LAMP STEAK ROD
- Narrow passage
- Orbicular chamber
- East/West corridor
- TAPESTRY
- Inhuman room — GOBLET
- Cavern — WATER

Problems Solved

The Axe of Kolt *Harry Bastien*

Begin by going Down, Down, South, South, South-West and South to the lampmaker. There you should talk, buy the lamp, examine it and talk some more, buy the tinderbox and talk again.

Now go South, Wait, Wait, talk, buy the oil and go South to the furrier. Talk, buy the fur and journey North and West to the armourer where you should talk and try to buy the axe.

Travel East and East to the beggar, talk to him and give him a coin. Now for a bit of walking: Go West, North, North, North, North-East, North, North, Up, East, East, North-East, wear the coat, Up and light the lamp.

Go Up again and East then East. Now enter the snow, go Up and RUN EAST. Enter the cave, sleep then upon awakening go Out. Now travel Down, Down and South to the Horse Dragoons. Remembering the clue

the beggar gave you, SAY FOREST, and go East, East, East, South and South to the ferryman.

Talk to him before going North, North, West and South to the sawmill. Talk then journey North, East and North to the blacksmith. Talk and give him the rod, then go South, South and In.

Talk to the Innkeeper and try to buy some ale before leaving. Now travel North and East to the old lady. Talk to her before you venture West, West, West and North to the farmer.

Once again engage in conversation and SAY SIEVE. Now go South, West, West, North-West, West, West, West and West to the armourer. Talk and buy the axe with which you can now chop logs. Go East, East, East, East, South-East, East, East, North and CHOP LOGS.

Get the sieve, go South, East, East and East to SIEVE SOIL. Then get the key and GIVE KEY, go West, South and In and buy

some ale. Now leave the Inn and travel North, North to the blacksmith and give him the ale and the rod.
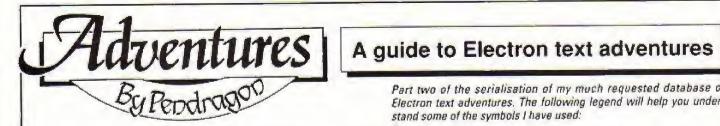
Go South, West and South to the sawyer and GIVE ROD. SAY FERRY, get the planks and journey North, East, South and South to the ferryman.

GIVE PLANKS and return North, North and North to the blacksmith's apprentice. Talk to him and SAY NAILS before indulging on a bit more travelling: South, West, West, West, West, North-West, West, West, West and South to the toolmaker.

Talk and buy the hammer, then return North, East, East, East, South-East, East, East, East, East, South and South to the ferryman. GIVE HAMMER, GIVE NAILS and BOARD FERRY.

Thus ends part one of this adventure. The code for entry to part two is: CLTH LGCH.

(To be continued)

Adventures By Pendragon

Part two of the serialisation of my much requested database of Electron text adventures. The following legend will help you understand some of the symbols I have used:

BBC Released for the BBC Micro but will run on an Electron if fitted with Slogger's Master Ram board

D Disc only adventures
G Graphics available
A For advanced adventurers only

The Druids Circle Mission XP2 Tomb of Death Pony Express Fire Island (Released in a limited number, and now very rare)		Hollsoft, 79 Hinde House Lane, Sheffield S4 8GZ

The Adventure Creator (utility) The Ket Trilogy		Incentive Software, 54 London Street, Reading RG1 4SQ Tel: 0734 591678

Ring of Time The Five Spheres Magic Adventure Dracula Island Revenge of Zor The Ferryman Awaits (All six of these adventures are now very difficult to find)	BBC BBC G	Kansas City Systems, Unit 3, Sutton Springs Wood, Chesterfield S44 5XF Tel: 0246 850357

Plane Crash Quest for the Pendragon		Labyrinth Software, 22 Nelson Street, Retford, Nottinghamshire DN22 6LP Tel: 0777 701669

The Rising of Salandra (two adventures) Wychwood The Nine Dancers The Puppet Man Hex		Larsoft (Larsoft has ceased trading, and these adventures can only be obtained from third party distributors)

In Search of Atahaulpa Annabel Gray		Lee Software, 35 Osprey Gardens, Worle, Weston-super-Mare, Avon BS22 8UN

Colossal Adventure	BBC A	Level 9 Computing, PO Box 39, Weston-super-Mare, Avon BS24 9UR Tel: 0934 814450 (Most Level 9 adventures will run on expanded 64k Electrons, though some may need a bit of coaxing – indicated by the @ symbol)
Dungeon Adventure	BBC A	
Adventure Quest	BBC A	
Snowball	BBC A	
Return to Eden	BBC A	
The Worm in Paradise	BBC A	
Lords of Time	BBC A	
Emerald Isle	BBC A G	
Red Moon	BBC A	
The Price of Magic	BBC A	
Lancelot	BBC A G @	
Knight Orc	BBC A G @	
Gnome Ranger	BBC A G @	
Ingrid's Back	BBC A G @	
Scapeghost	BBC A G @	

Stolen Lamp Special Operations (These adventures are now available through Argus Publishing)	 G	MC Lothlorien, 56a Park Lane, Poynton, Cheshire SK12 1RE Tel: 0625 876642

Village of Lost Souls Locks of Luck What's Eeyore's?	BBC	Magus (Magus has ceased trading, but Village of Lost Souls has been recoded by Robico)

The Hobbit Lord of the Rings Hampstead Denis Through the Drinking Glass Terrormolinos Dodgy Geezers Classic Adventure	BBC BBC	Melbourne House, 2-4 Vernon Yard, Portobello Road, London W11 2DX Tel: 01-727 8070

Labyrinth of La Coshe Adventure Wizard's Challenge Eldorado Gold (All these adventures are like gold dust and very difficult to come by)		Micro Power, Northwood House, North Street, Leeds LS7 2AA Tel: 0532 458800

The Pen and the Dark The Saga of Eric the Viking Secret Diary of Adrian Mole Growing Pains of Adrian Mole The Archers	BBC BBC G BBC BBC BBC	Mosaic Publishing, 187 Upper Street, Islington, London N1 1RQ Tel: 01-226 0828

Firienwood Sadim Castle Valley of the Kings Blue Dragon Survivor Woodland Terror		MP Software (MP Software has ceased trading and these adventures are only available through third party distributors)

The Banished Prince		Orbit Software, 7 Brookside Avenue, Stockton Heath, Warrington WA4 2XG Tel: 0925 66741

The Staff of Law Galadriel in Distress Super Agent Flint Return of Flint Flint Strikes Back Twin Orbs of Aalinor Inner Space Hexagram of Trutania Valley Stranded on Iloofrax Philosopher's Stone Grounded Adventure of the Stone		Potter Programs, 7 Warren Close, Sandhurst, Camberley GU17 8JR Tel: 0252 877608

Just having a ball

Neil Davidson reveals how he came to write the latest arcade game released by Superior

RICOCHET is about a little red bouncy ball's quest to save the world from yet another evil dictator, who has stolen the five hourglasses of time. You have to retrieve them and teleport safely out of each level.

The game's origins can be traced back to the last few months of 1985 when Roland Waddilove's articles on machine code graphics were first published in *Electron User*.

At the time, I knew next to nothing about machine code, so although I could draw pretty pictures, I couldn't manipulate them. To rectify this omission I bought a book on machine code and avidly read it from cover to cover and wrote little programs until I was reasonably fluent in it.

My interest in writing a commercial game was rekindled in late 1988 by a series of articles on the same subject in *Electron User*, again by Roland Waddilove. This time, however, I had the means to put some of my ideas into practice.

I approached David Williams, and asked him if he would be interested in atttempting to write a 100 per cent machine code game. He agreed and so we started.

I began writing the game in May 1988, and started in what I now recognise to be completely the wrong way. Instead of sitting down and planning out the game on paper,

like any normal, sane, person would do, I decided to rush in headlong and write the code without really thinking about it.

I wrote it backwards, starting with little unconnected bits of code which I thought might be useful, and racked my brain to think of some adequate way to link them up.

One consequence of this method was that I often stumbled across inefficient, and even redundant, pieces of code which I duly deleted and rewrote. Perhaps the most obvious example of this is the graphics – we originally started with about twice as many characters as we have now, and I rewrote some of the relevant code up to four times.

The game took a long time to write – about a year and a half, on and off – and I sometimes uncovered code which I was sure had some deep and meaningful relevance, but couldn't be exactly sure what it was.

One of the most persistant bugs turned out to be in a piece of the code which I had completely forgotten about a year previously. It can be very frustrating to look through pages of code for a missing colon,

or a SEC instead of a CLC.

In retrospect, I would advise potential authors to plan out their games, especially the memory needed for the sprites and code. You don't want to be in the position I was, scouring the code for places where a byte or two could be saved – yes, it really was that bad.

You should, of course, make frequent backups of the code. I found it annoying when I frequently deleted several day's work by mistake, but it could have been worse.
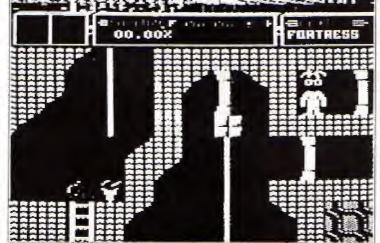
The graphics in the game came from David Williams, Nick Weston and Guy Burt. I was lucky that I could afford not to worry too much about this aspect myself.

There are five levels, each one harder than the last. There are over 330 different screens in all. The first level, entitled Fortress, is intended to be the easiest of the five, although some people might disagree.

In it you meet some of the puzzles you will need to solve. How will you manage to bribe the robber in his cute little striped shirt? What is lurking inside the wicker laundry basket, and how will you entice it out? What part does the strange alchemist in his white lab coat play in all this?

As you progress you will find, I hope, that the puzzles become slightly more sophisticated. How to make the slug disappear on level two? Find the best way to navigate to the infuriating cargo hold on the UFO.

Even if I haven't managed to persuade you that I think the game is well worth buying – after all, I am very slightly biased – I hope you will have a go at writing your own game. To coin a cliche, you'll never know until you've tried.

Ricochet is the result of 18 months' work

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Getting started in BBC Basic on the BBC Micro & Electron

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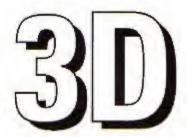
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TO ORDER PLEASE USE THE FORM ON PAGE 45

Chart it in 3D

The 3D pie chart is drawn in four-colour Mode 1

Enliven all those statistical presentations with Jon Willington's graphics utility

PIE Chartist is a clever graphics utility program occupying about 2.5k of ram. The user inputs data which is then displayed graphically in the form of a three dimensional pie chart.

The routine incorporates full labelling of the chart and the four colours of Mode 1 are used to give a clear and visually attractive result. The program would prove almost impossible to transfer to any other micro, as it relies heavily on the powerful graphics commands of Electron Basic.

When the program is run the user inputs his data in the form of a table, which is then scrolled to the bottom of the screen and the chart plotted above it.

PROGRAM CONSTRUCTION

30-60 Set mode, colours and variables
100-180 Calculate angles of sectors and store in array H%
200-280 Draw insides of sectors – the stripey effect is obtained by the use of the GCOL command in line 180
300-370 Draw the top of sectors
390-440 Draw outside of pie
460-530 Label the sectors
560-850 Input routine
860-910 Routine for 3D lettering of the title
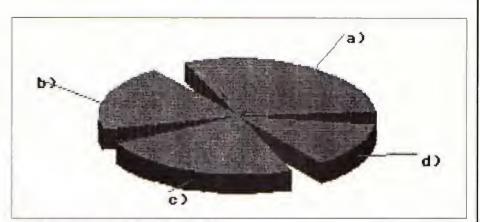
```
   10 REM *** PIE-CHARTIST ***
   20 REM * Jon Willington **
   25 REM *(C) ELECTRON USER *
   30 MODE1
   40 X%=640:Y%=512:J%=400:K%=150
   50 VDU19,3,4;0;19,1,6;0;
   60 V=0:D%=-50
   70 A$="PIE-CHARTIST":PROCtitle
   80 PROCinput
   90 REM* Calculate angles of se
ctors*
  100 T=48-2*N:R=T/V
  110 FOR B=1 TO N:Q(B)=Q(B)*R
  120 Q(B)=INTQ(B)-(Q(B)-INTQ(B)>
.5)
  130 NEXT:F=1
  140 FOR B=1 TO N
  150 H%(B,1)=F:H%(B,2)=H%(B,1)+Q
(B)
  160 F=H%(B,2)+2:NEXT
  170 P=(H%(N,2)+1)/(2*PI)
  180 GCOL11,129
  190 REM *** Draw sides of secto
rs ***
  200 VDU23,1,0;0;0;0;
  210 FOR A%=1 TO N
  220 M=H%(A%,1)/P
  230 MOVE X%,Y%:MOVEX%,Y%+D%
  240 IF COSM>0 PLOT87,J%*COS(M)+
X%,K%*SIN(M)+Y%:PLOT83,0,D%
  250 MOVE X%,Y%:MOVEX%,Y%+D%
  260 M=H%(A%,2)/P
  270 IF COSM<0 PLOT87,J%*COS(M)+
X%,K%*SIN(M)+Y%:PLOT83,0,D%
  280 NEXT:GCOL0,1
  290 REM *** Draw top of pie ***
*
  300 VDU 23,1,0;0;0;0;
  310 FOR A%=1 TO N
  320 M=(H%(A%,1)/P)
  330 MOVEJ%*COS(M)+X%,K%*SIN(M)+
Y%
  340 FOR F%=H%(A%,1) TO H%(A%,2)
  350 MOVEX%,Y%
  360 PLOT85,J%*COS(F%/P)+X%,K%*S
IN(F%/P)+Y%
  370 NEXT:NEXT:GCOL0,3
  380 REM *** Draw outside of pie
 ***
  390 FOR A%=1 TO N
  400 FOR F%=H%(A%,1) TO H%(A%,2)
-1
  410 M=F%/P:V=(F%+1)/P
  420 IF SINM>0 THEN 440
  430 MOVEJ%*COS(M)+X%,K%*SIN(M)+
Y%:PLOT0,0,D%:PLOT85,J%*COS(V)+X%
,K%*SIN(V)+Y%:PLOT81,0,D%
  440 NEXT:NEXT
  450 REM *** Label sectors ***
  460 FOR M=1 TO N
  470 V=(H%(M,2)-H%(M,1))/2:V=V+H
%(M,1):V=V/P
  480 GCOL0,1:VDU5
  490 MOVE400*COS(V)+X%,150*SIN(V
)+490
  500 DRAW600*COS(V)+X%,225*SIN(V
)+530
  510 MOVE610*COS(V)+X%,233*SIN(V
)+530
  520 GCOL0,2:PRINTCHR$(96+M);CHR
$(41):GCOL0,3
  530 NEXT
  540 REPEAT UNTIL FALSE
  550 END
  560 DEFPROCinput
  570 VDU4:COLOUR128:COLOUR1
  580 VDU23,1,0;0;0;0;
  590 INPUTTAB(2,8)"TITLE OF CHAR
T",A$
  600 INPUT TAB(2,10)"NUMBER OF S
ECTORS (MAX: 10)"N
  610 IF N<1 0% N>10 THEN VDU7:CL
S:GOTO600
  620 DIM Q(N),H%(N,2)
  630 PRINT'"NOW COMPLETE THIS TA
BLE"
  640 W=INKEY(150)
  650 VDU12,17,2,17,131
  660 PRINT'''"   NAME OF ENTRY";
SPC9;"VALUE";SPC10
  670 GCOL0,1
  680 MOVE0,928:PLOT1,0,-36-(N*32
)
  690 PLOT1,1279,0:DRAW1279,928
  700 GCOL3,1:MOVE640,928
  710 PLOT1,0,-36-(N*32):COLOUR12
8:COLOUR 2
  720 FOR A=1 TO N
  730 PRINTTAB(1,3+A)CHR$(96+A);C
HR$41
  740 INPUTTAB(5,3+A)D%$
  750 INPUTTAB(25,3+A)Q(A)
  760 V=V+Q(A)
  770 NEXT
  780 FOR G=1 TO (31-VPOS)
  790 VDU31,0,0,11
  800 VDU23,1,0;0;0;0;
  810 DELAY=INKEY5
  820 NEXT
  830 PROCtitle
  840 VDU29,0;(N*32)/2;
  850 ENDPROC
  860 DEFPROCtitle
  870 COLOUR131:PRINTTAB(0,0)STRI
NG$(80,CHR$32)
  880 VDU5:CV=640-(LENA$*16)
  890GCOL0,0:MOVECV,1015:PRINTA$:
MOVECV+4,1011:PRINTA$:GCOL0,2:MOV
ECV+8,1007:PRINTA$
  900 VDU 4
  910 ENDPROC
```

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EU1

G RAFIX is a pair of utilities which enable complex graphics programs written in ordinary Basic to be converted into machine code. It can be looked upon as a primitive form of Basic compiler and could be used for, say, converting loading or menu screens written in Basic into machine code.

First run Coder to assemble some machine code routines in memory. Now load the graphics program and insert a *ON at the start and a *OFF at the end like:

```
10 *ON
20 MODE 2
30 FOR I=1 TO 25
40 GCOL 0,RND(8)-1
50 PLOT 85,RND(1280),RND(1024)
60 NEXT
70 *OFF
```

Run the program as normal and while it is drawing a special data file of VDU codes will be automatically saved. Load and run Linker when it has finished. This will take the data file and tag some machine code on to it and save the resultant program to tape or disc.

This final graphics program can be used in several ways. You can *RUN it, or you can *LOAD and then call its starting address or

```
           * VDU Linker *

Where do you wish to store the program?

Address: &900
Data's filename: DATA
Program name: PIC1
```

Linking the VDU data file and machine code execution routine

you can call it from within a machine code program using a simple JSR.
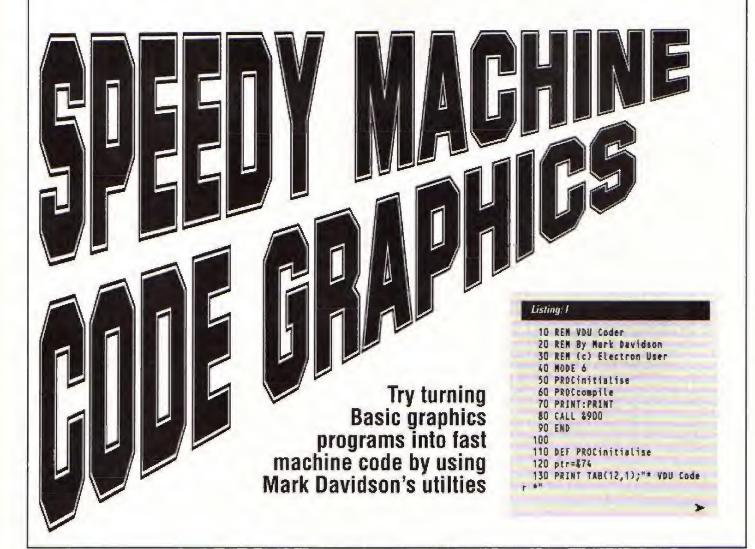
Coder is responsible for creating a block of data which increases in size as each graphic command is executed. The data is then saved with a filename supplied by you. This coding of the program is achieved by intercepting the oswrch operating system routine at &FFEE, and copying the accumulator contents – the VDU code – to a specified memory location, called *location%* in the listing. It then increments *location%* so that the next intercepted VDU code is stored one byte further on.

The first two bytes of this block contain a counter which is updated as the coding continues. This is later used by a machine code execution routine to detect the end of the graphic data.

In fact the data is stored at the end of the Basic graphics program. First though, you need to decide how much space to allocate for variables used by the program. This space is allocated in single page (256 bytes) chunks and typing Return at the prompt selects the default value of one page.

Linker supplies the machine code execution routine and is responsible for splicing it with the data file. It asks first of all for the address the program is to be run from, which can anywhere in the available ram. Then it asks for the datablock's filename and for a filename to assign to the resultant program.

With the aid of these two utilities you can write fast machine code graphics programs with ease.

Try it out and amaze your friends

SPEEDY MACHINE CODE GRAPHICS

Try turning Basic graphics programs into fast machine code by using Mark Davidson's utilties

```
  140 INPUT TAB(1,5);"Filename: "
file$
  150 PRINT TAB(1,9);"Variable sp
ace? (Default=1 page)"
  160 INPUT TAB(1,11);": "space%
  170 If space%<1 space%=1
  180 ENDPROC
  190
  200 DEF PROCcompile
  210 VDU 28,0,23,39,13
  220 FOR I=0 TO 3 STEP 3
  230 P%=&900
  240 [OPT I
  250 \Enable *ON and *OFF comman
ds
  260 SEI
  270 LDA &208:STA oscli temp
  280 LDA &209:STA oscli temp+1
  290 LDA #oscli MOD 256:STA &208
  300 LDA #oscli DIV 256:STA &209
  310 CLI
  320 RTS
  330
  340 \Start of OSCLI intercept
  350 .oscli STX &70:STY &71
  360
  370 LDY#0
  380 .first loop
  390 LDA (&70),Y:CMP first,Y
  400 BNE next
  410 INY:CPY #3:BNE first loop
  420 JMP on
  430
  440 .next
  450 LDY #0
  460 .second loop
  470 LDA (&70),Y:CMP second,Y
  480 BNE os
  490 INY:CPY #4:BNE second loop
  500 JMP off
  510
  520 .os
  530 LDX &70:LDY &71:JMP (oscli
temp)
  540
  550 .first  EQUS"*ON"+CHR$13
  560 .second EQUS"*OFF"+CHR$13
  570
  580 .oscli temp EQUW 0
  590
  600 \Initialise the 'intercept'
  610 \and 'save' routines
  620 .on SEI
  630 LDA &20E:STA oswrch temp:LD
A &20F:STA oswrch temp+1:LDA #(ne
w MOD 256):STA &20E:LDA #(new DIV
256):STA &20F
  640 CLC:LDA &12:STA ptr:LDA &13
:ADC #space%:STA ptr+1
  650 LDA ptr:STA param1:STA para
m2:STA param3:STA count+1
  660 LDA ptr+1:STA param1+1:STA
param2+1:STA param3+1:STA count+2
  670 LDA ptr:CLC:ADC #1:STA coun
t+6:LDA ptr+1:ADC #0:STA count+7
  680 LDA ptr:CLC:ADC #2:STA new+
1:LDA ptr+1:ADC #0:STA new+2
  690 LDY #0:TYA:STA (ptr),Y:INY:
STA (ptr),Y
  700 CLI:RTS
  710
  720 .oswrch temp EQUW 0
  730
  740 \The intercept routine
  750 .new STA &FFFF:PHA
  760 .count INC &FFF:BNE pass:IN
```

```
C &FFF
  770 .pass
  780 INC new+1:BNE not hit zero
  790 .hit zero INC new+2
  800 .not hit zero LDA new+1
  810 STA param4
  820 LDA new+2:STA param4+1
  830 PLA
  840 JMP (oswrch temp)
  850 \End of intercept routine
  860
  870 \Restore old vector content
s
  880 \of OSCLI and OSWRCH and sa
ve data
  890 .off LDA oscli temp:STA &20
8:LDA oscli temp+1:STA &209
  900 LDA oswrch temp:STA &20E:LD
A oswrch temp+1:STA &20F
  910 LDA #0:LDX #(block MOD 256)
:LDY #(block DIV 256):JSR &FFDD:R
TS
  920 .block EQUW addr
  930 .param1 EQUW 0
  940 EQUW 0
  950 .param2 EQUW 0
  960 EQUW 0
  970 .param3 EQUW 0
  980 EQUW 0
  990 .param4 EQUW 0
 1000 EQUW 0
 1010 .addr EQUS file$+CHR$13
 1020 ]
 1030 NEXT
 1040 ENDPROC
```

Listing: II

```
   10 REM VDU Linker
   20 REM By Mark Davidson
   30 REM (c) Electron User
   40 MODE6
   50 CLEAR
   60 code%=TOP+512
   70 PROCinitialise
   80 PROCmc code
   90 PROCget data
  100 PROCsave file
  110 PRINT:PRINT
  120 END
  130
  140 DEF PROCinitialise
  150 PRINT TAB(11,1);"* VDU Link
er *"
  160 PRINT TAB(0,5)"Where do you
wish to store the program?"
  170 INPUTTAB(0,8);"Address: &"a
ddress$
```

```
  180 Address%=EVAL("&"+address$)
  190 ENDPROC
  200
  210 DEF PROCmc code
  220 FOR I=4 TO 6 STEP2
  230 O%=code%:P%=Address%
  240 [ OPT I
  250 LDA #((data+2) MOD 256)
  260 STA loop+1
  270 LDA #((data+2) DIV 256)
  280 STA loop+2
  290 LDA #0
  300 STA size
  310 STA size+1
  320 .start
  330 LDA size
  340 CMP data
  350 BEQ p1
  360 INC size
  370 BNE loop
  380 INC size+1
  390 JMP loop
  400 .p1 LDA size+1
  410 CMP data+1
  420 BEQ p2
  430 INC size
  440 BNE loop
  450 INC size+1
  460 .loop LDA data+2
  470 JSR &FFEE
  480 INC loop+1
  490 BNE pass
  500 INC loop+2
  510 .pass JMP start
  520 .p2 RTS
  530 .size EQUW 0
  540 .data
  550 ]
  560 NEXT
  570 ENDPROC
  580
  590 DEF PROCget data
  600 INPUT'"Data's filename: "in
put$
  610 line$="LOAD "+input$+" "+ST
R$~O%
  620 OSCLI(line$)
  630 ENDPROC
  640
  650 DEF PROCsave file
  660 INPUT'"Program name: "outpu
t$
  670 line$="SAVE "+output$+" "+S
TR$~code%+" "+STR$~(O%+?O%+(256*?
(O%+1))+2)+" "+STR$~Address%+" "+
STR$~Address%
  680 OSCLI(line$)
  690 ENDPROC
```

Box (top right):

```
* VDU Coder *

Filename: DATA

Variable space? (Default=1 page)
: 2

0A05  00  00       .param2 EQUW 0
0A07  00  00        EQUW 0
0A09  00  00       .param3 EQUW 0
0A0B  00  00        EQUW 0
0A0D  00  00       .param4 EQUW 0
0A0F  00  00        EQUW 0
0A11  44  41  54
      41  0D       .addr EQUS file$+CHR$13
```

Installing the machine code routines

NEW! TEN of the BEST!

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Packed full of some of the best educational games from the pages of *Electron User*, the new Ten of the Best Educational Games is the ideal way for your children to learn about maths, spelling, anagrams, telling the time, general knowledge, and even the rudiments of running a business!

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Wayne Boyd presents two very useful disc editors, one ADFS and the other DFS

Handle with care
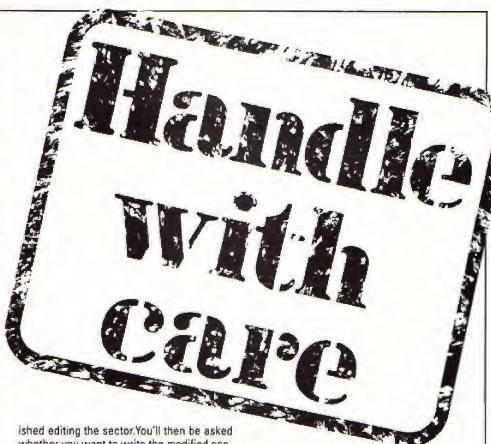
A DISC editor is a powerful tool for examining the contents of a disc. With it you can recover deleted program files and data and repair corrupt discs. Two versions have been featured a long time ago in *Electron User*, but many new readers have requested re-runs of some of the best utilities from past issues.

So here are updated versions of two discs editors – one for DFS and one for ADFS users. They are identical in use and utilise very similar listings, but the two filing systems require different operating calls to access them.

Run the program and enter a disc address to examine at the prompt. This number, which should be in hexadecimal, is the sector number counting from the start of the disc. The sector is loaded and displayed in hexadecimal and Ascii on a Mode 0 screen. If this isn't the sector you want to edit, or if you are simply browsing, use the up and down cursor keys to move to the next or previous sector.

When you get to the correct sector press H and the cursor will move to the top left number – the first byte of the sector. You can move to any byte using the cursor keys and enter any hex value by typing it in at the keyboard. Press Return when you have fin-ished editing the sector. You'll then be asked whether you want to write the modified sector to disc – press Y or N, but before you do, double check that you have not accidentally deleted or altered the wrong thing.

Next comes a menu with three options: Re-edit sector, Load new sector or Quit program.

You can re-edit the same sector – although there's probably not much point unless you have made a mistake – or load and edit a new one. A printout of the current sector may be obtained at any time by pressing the Copy key.

Take care when modifying disc contents, as it is quite easy to erase valuable data or even corrupt the disc so that it becomes unreadable.

```
   10 REM ********************
   20 REM * DFS  DISC EDITOR *
   30 REM *   By Wayne Boyd   *
   40 REM * (c) Electron User *
   50 REM ********************
   60 REM
   70 MODE0: PROCsetup: PROCtit
le: REPEAT
  120 PROCinput: REPEAT: PROCrea
d: PROCdis: UNTIL happy: happy=FA
LSE
  180 PROCedit
  190 PROCcheck: IF load=TRUE TH
EN load=FALSE:GOTO 120
  210 IF write=TRUE THEN write=F
ALSE ELSE GOTO 180
  220 PROCwrite: GOTO 190: UNTIL
FALSE: END
  260 DEFPROCsetup: happy=FALSE:
 write=FALSE: load=FALSE: omit=FA
LSE:VDU 19,0,0,0;: DIM buffer 256:
DIM block 16:osword=&FFF1: ENDPRO
C
  360 DEFPROCtitle:PRINTSTRINGS(8
0,"*"):PRINTTAB(31)" DFS DISC EDI
TOR":PRINT'TAB(27)" Written By Wa
yne G Boyd ":PRINT'STRINGS(80,"*"
):VDU28,1,31,79,25: PRINT'':CLS:
ENDPROC
  420 DEFPROCread:IF da$="" da$="
00"
  440 dadd=EVAL("&"+da$):?block=0
:REM error number
  460 block!1=buffer :REM load ad
dress
  470 block?5=3
  480 block?6=&53
  490 block?7=dadd DIV 10
  491 block?8=dadd MOD 10
  520 block?9=&21
  530 A%=&7F:X%=block MOD 256:Y%=
block DIV 256:CALL osword:
  580 B%=&0D0904:ENDPROC
  600 DEFPROCmaindis:cu=0:FOR I%
=1 TO 16:a$="":PRINT"   ";:FOR K%
=1 TO 16:cu=cu+1:byte=?(buffer+cu
):IF byte<32 OR byte>126 THEN a$=
a$+"." ELSE a$=a$+CHR$(byte)
  710 PRINT" ";byte DIV 16;"byte
MOD 16;: NEXT: PRINT"    ";a$: N
EXT:ENDPROC
  760 DEFPROCdis:VDU28,0,24,79,8:
CLS:PROCmaindis:VDU28,1,31,79,25
:CLS:PRINT" Enter new sector addr
ess : &";:PRINT"        OR
 USE THE CURSOR KEYS": *FX4,1
  830 PRINTSPC(47)" TO ADJUST THE
 SECTOR":PRINTSPC(47)" USE ONLY T
HE UP & DOWN":PRINTSPC(47)" CURSO
R KEYS":PRINTSPC(47)" 'H' When ha
ppy.":PRINTTAB(2,2)"Sector addres
s : ";dadd;" / &";STR$"dadd:PRINT
TAB(2,3)"Track : ";dadd DIV 10:
  831 PRINTTAB(2,4)"sector : ";d
add MOD 10
  900 PRINTTAB(29,0);"  ";:PRINT
TAB(29,0);:G$=GET$: IF ASC(G$)=13
5 THEN back=TRUE:PROCprintout
  930 IF G$="H" THEN happy=TRUE:
ENDPROC
  940 IF ASC(G$)=138 THEN dadd=d
add-1:da$=STR$"dadd:ENDPROC
  950 IF ASC(G$)=139 THEN dadd=d
add+1:da$=STR$"dadd:ENDPROC
  960 IF ASC(G$)<48 OR ASC(G$)>7
0 THEN GOTO 900
  970 PRINTG$;:GG$=GET$:IF ASC(GG
$)=13 THEN GGG$="":GOTO 1030
 1000 PRINTGG$;:GGG$=GET$: PRINT
GGG$;
 1030 da$=G$+GG$+GGG$: ENDPROC
 1050 DEFPROCinput: VDU28,0,24,79
,8: CLS: PRINTTAB(3,5)" By pressi
ng the [COPY] key in the EDITOR o
r the SEARCHER sections of this "
: PRINTTAB(2,6)" program you will
 get a print out of the sector be
ing worked on at that time": VDU2
8,1,31,79,25:CLS
 1110 INPUT ''"Enter the sector a
ddress : &"da$:ENDPROC
 1130 DEFPROCedit_controls: PRINT
TAB(0,0)SPC(80):PRINTTAB(40,1)SPC
(40):PRINTTAB(40,2)SPC(40):PRINTT
AB(40,3)SPC(40):PRINTTAB(40,4)SPC
(40):PRINTTAB(40,0)"      ....EDI
T....":PRINTTAB(40,2)" Use curso
r keys to ":PRINTTAB(40,3)" move
 cursor and enter":PRINTTAB(40,4)
" the values required":PRINTTAB(
40,5)" [RETURN] when happy": END
PROC

                               ➤
```

```
   1210 DEFPROCasc_ch: yy=(total-1
) DIV 16: col=(total-1) MOD 16: x
=6+col-2+(col*2): PRINTTAB(xx,yy
);"G DIV 16;"G MOD 16;: ENDPROC
   1270 DEFPROCsnd
   1280 GG=GET:IF GG>47 AND GG<71 T
HEN ELSE GOTO 1280
   1300 PRINTCHR$(GG);:input$=CHR$(
G)+CHR$(GG):input=EVAL("&"+input$
): xx=((x-4)DIV 3)-1+56: yy=y: yv
al=y*16:xval=xx-55:total=yval+xva
l+1:?(buffer+total)=input: If inp
ut>31 AND input<127 THEN PRINTTAB
(xx,yy);CHR$(input); ELSE PRINTTA
B(xx,yy);".";
   1370 ENDPROC
   1380 DEFPROCedit:PROCedit_contro
ls: x=4:y=0:VDU28,0,24,79,8: st=3
: chr=FALSE:REPEAT:PRINTTAB(x,y);
:G=GET:IF G=135 THEN back=FALSE:P
ROCprintout
   1480 IF G=13 THEN ENDPROC
   1490 IF G=138 THEN y=y+1
   1500 IF G=139 THEN y=y-1
   1510 IF G=137 THEN x=x+st
   1520 IF G=136 THEN x=x-st
   1530 IF x<4 THEN x=49
   1540 IF x>49 AND chr=FALSE THEN
x=55:chr=TRUE:st=1
   1550 IF x<55 AND chr=TRUE THEN x

=49:chr=FALSE:st=3
   1560 IF x>70 AND chr=TRUE THEN x
=55
   1570 IF y>15 THEN y=0
   1580 IF y<0 THEN y=15




   1590  PRINTTAB(x,y);:: IF chr=TRU
E AND G>31 AND G<127 THEN PRINTCH
R$(G);:yval=y*16:xval=x-55:total=
yval+xval+1:?(buffer+total)=G:PRO
Casc_ch:x=x+1:PRINTTAB(x,y);

   1610  IF chr=FALSE AND G>47 AND
G<71 THEN PRINTCHR$(G);:PROCsnd:x
=x+3:PRINTTAB(x,y);
   1620  UNTIL FALSE
   1630 DEFPROCcheck:VDU28,1,31,79,
25:PRINTTAB(0,0)SPC(80):PRINTTAB(
40,1)SPC(40):PRINTTAB(40,2)SPC(40
):PRINTTAB(40,3)SPC(40):PRINTTAB(
40,4)SPC(40):PRINTTAB(40,5)SPC(38
): IF omit=TRUE THEN omit=FALSE:G
OTO 1740
   1670  PRINTTAB(47,2)"DO YOU WANT
TO WRITE": PRINTTAB(47,3)"THIS S
ECTOR TO THE ": PRINTTAB(47,4)"DI
SC   (Y/N) :";:G$=GET$:IF G$="Y"
THEN write=TRUE:PRINT"YES":ENDPRO
C
   1720 PRINT"NO":PRINTTAB(0,0)SPC(
80):PRINTTAB(40,1)SPC(40):PRINTTA
B(40,2)SPC(40):PRINTTAB(40,3)SPC(
40):PRINTTAB(40,4)SPC(40):PRINTTA
B(40,5)SPC(38)
   1740 PRINTTAB(40,0)"  You can no
w choose to :-":PRINTTAB(40,2)"
1. RE-EDIT SECTOR":PRINTTAB(40,3)
"  2. LOAD NEW SECTOR":PRINTTAB(4
0,4)"  3. QUIT PROGRAM":PRINTTAB(
40,5)"  :";
   1790 G$=GET$:IF G$="1" THEN load
=FALSE:write=FALSE:ENDPROC
   1810 IF G$="2" THEN load=TRUE:wr
ite=FALSE:ENDPROC
```

Handle with care

```
1820 IF G$="3" THEN CALL!-4
1830 GOTO 1790:ENDPROC
1850 DEFPROCwrite:?block=0:block
!1=buffer:block?5=3:block?6=&48:b
lock?7=dadd DIV 10:block?8=dadd M
OD 10:block?9=&21:A%=&7F:X%=block
MOD 256:Y%=block DIV 256:CALL os
word:IF ?block>0 PRINT"Disc error
":END
1990 omit=TRUE:ENDPROC
2010 DEFPROCprintout: VDU28,0,24
,79,8: VDU2: PRINT'"   SECTOR :
&";STR$"dadd: PROCmaindis: PRINT:
VDU3: CLS:PROCmaindis: IF back=T
RUE THEN VDU28,1,31,79,25
2070 ENDPROC

    10 REM ********************
    20 REM * ADFS  DISC EDITOR *
    30 REM *   By Wayne Boyd   *
    40 REM * (c) Electron User *
    50 REM ********************
    60 REM
    65 *ADFS
    66 *MOUNT
    70 MODE0: PROCsetup: PROCtit
le: REPEAT
   120 PROCinput: REPEAT: PROCrea
d: PROCdis: UNTIL happy: happy=FA
LSE
   180 PROCedit
   190 PROCcheck: IF load=TRUE TH
EN load=FALSE:GOTO 120
   210 IF write=TRUE THEN write=F
ALSE ELSE GOTO 180
   220 PROCwrite: GOTO 190: UNTIL
FALSE: END
   260 DEFPROCsetup: happy=FALSE:
write=FALSE: load=FALSE: omit=FA
LSE:VDU 19,0,4;0;: DIM buffer 256:
DIM block 16:osword=&FFF1: ENDPRO
C
   360 DEFPROCtitle:PRINTSTRING$(8
0,"*"):PRINTTAB(31)"ADFS DISC EDI
TOR":PRINT'TAB(27)" Written By Wa
yne 6 Boyd ":PRINT'STRING$(80,"*"
):VDU28,1,31,79,25: PRINT'':CLS:
ENDPROC
   420 DEFPROCread:IF da$="" da$="
00"
   440 dadd=EVAL("&"+da$):?block=0
:REM error number
   460 block!1=buffer :REM load ad
dress
   470 block?5=8 :REM read command
   480 block?6=0 :REM disc address
MSB 1st
   490 block?7=dadd DIV 256:block?
8=dadd MOD 256:block?9=1 :REM 1 s
ector
   520 block?10=0 :REM unused
   530 A%=&72:X%=block MOD 256:Y%=
block DIV 256:CALL osword:IF ?blo
ck>0 PRINT"Disc error":END
   580 a%=&000904:ENDPROC
   600 DEFPROCmaindis:cu=0:FOR I%
=1 TO 16:a$="":PRINT"   ";:FOR K%
=1 TO 16:cu=cu+1:byte=?(buffer+cu
):IF byte<32 OR byte>126 THEN a$=
a$+"." ELSE a$=a$+CHR$(byte)
   710 PRINT" ";"byte DIV 16;"byte
MOD 16;" NEXT: PRINT"    ";a$: N
EXT:ENDPROC
   760 DEFPROCdis:VDU28,0,24,79,8:
CLS:PROCmaindis:VDU28,1,31,79,25
:CLS:PRINT" Enter new sector addr
ess : &";:PRINT"      OR
```

```
USE THE CURSOR KEYS": *FX4,1
   830 PRINTSPC(47)" TO ADJUST THE
SECTOR":PRINTSPC(47)" USE ONLY T
HE UP & DOWN":PRINTSPC(47)" CORSO
R KEYS":PRINTSPC(47)" 'H' When ha
ppy.":PRINTTAB(2,2)"Sector addres
s : ";dadd;" / &";STR$"dadd:PRINT
TAB(2,3)"Track : ";dadd DIV 16:PR
INTTAB(2,4)"sector : ";dadd MOD 1
6
   900 PRINTTAB(29,0);"   ";:PRINT
TAB(29,0);:G$=GET$: IF ASC(G$)=13
5 THEN back=TRUE:PROCprintout
   930 IF G$="H" THEN happy=TRUE:
ENDPROC
   940 IF ASC(G$)=138 THEN dadd=d
add-1:da$=STR$"dadd:ENDPROC
   950 IF ASC(G$)=139 THEN dadd=d
add+1:da$=STR$"dadd:ENDPROC
   960 IF ASC(G$)<48 OR ASC(G$)>7
0 THEN GOTO 900
   970 PRINTG$;:GG$=GET$:IF ASC(GG
$)=13 THEN GGG$="":GOTO 1030
  1000 PRINTGG$;:GGG$=GET$: PRINT
GGG$;
  1030 da$=G$+GG$+GGG$: ENDPROC
  1050 DEFPROCinput: VDU28,0,24,79
,8: CLS: PRINTTAB(3,5)" By pressi
ng the [COPY] key in the EDITOR o
r the SEARCHER sections of this "
: PRINTTAB(2,6)" program you will
get a print out of the sector be
ing worked on at that time": VDU2
8,1,31,79,25:CLS
  1110 INPUT ''"Enter the sector a
ddress : &"da$:ENDPROC

  1130 DEFPROCedit_controls: PRINT
TAB(0,0)SPC(80):PRINTTAB(40,1)SPC
(40):PRINTTAB(40,2)SPC(40):PRINTT
AB(40,3)SPC(40):PRINTTAB(40,4)SPC
(40):PRINTTAB(40,0)"     ....EDI
T....":PRINTTAB(40,2)" Use curso
r keys to ":PRINTTAB(40,3)"  move
cursor and enter":PRINTTAB(40,4)
"  the values required":PRINTTAB(
40,5)"  [RETURN] when happy": END
PROC
  1210  DEFPROCasc_ch: yy=(total-1
) DIV 16: col=(total-1) MOD 16: x
x=6+col-2+(col*2): PRINTTAB(xx,yy
);"G DIV 16;"G MOD 16;: ENDPROC
  1270 DEFPROCsnd
  1280 GG=GET:IF GG>47 AND GG<71 T
HEN ELSE GOTO 1280
  1300 PRINTCHR$(GG);:input$=CHR$(
G)+CHR$(GG):input=EVAL("&"+input$
```

```
): xx=((x-4)DIV 3)-1+56: yy=y: yv
al=y*16:xval=xx-55:total=yval+xva
l+1:?(buffer+total)=input: IF inp
ut>31 AND input<127 THEN PRINTTAB
(xx,yy);CHR$(input); ELSE PRINTTA
B(xx,yy);".";
  1370 ~ENDPROC
  1380 DEFPROCedit:PROCedit_contro
ls: x=4:y=0:VDU28,0,24,79,8: st=3
: chr=FALSE:REPEAT:PRINTTAB(x,y);
:G=GET:IF G=135 THEN back=FALSE:P
ROCprintout
  1480 IF G=13 THEN ENDPROC
  1490 IF G=138 THEN y=y+1
  1500 IF G=139 THEN y=y-1
  1510 IF G=137 THEN x=x+st
  1520 IF G=136 THEN x=x-st
  1530 IF x<4 THEN x=49
  1540 IF x>49 AND chr=FALSE THEN
x=55:chr=TRUE:st=1
  1550 IF x<55 AND chr=TRUE THEN x
=49:chr=FALSE:st=3
  1560 IF x>70 AND chr=TRUE THEN x
=55
  1570 IF y>15 THEN y=0
  1580 IF y<0 THEN y=15
  1590  PRINTTAB(x,y);; IF chr=TRU
E AND G>31 AND G<127 THEN PRINTCH
R$(G);:yval=y*16:xval=x-55:total=
yval+xval+1:?(buffer+total)=G:PRO
Casc_ch:x=x+1:PRINTTAB(x,y);
  1610 IF chr=FALSE AND G>47 AND
G<71 THEN PRINTCHR$(G);:PROCsnd:x
=x+3:PRINTTAB(x,y);
  1620 UNTIL FALSE
  1630 DEFPROCcheck:VDU28,1,31,79,
25:PRINTTAB(0,0)SPC(80):PRINTTAB(
40,1)SPC(40):PRINTTAB(40,2)SPC(40
):PRINTTAB(40,3)SPC(40):PRINTTAB(
40,4)SPC(40):PRINTTAB(40,5)SPC(38
): IF omit=TRUE THEN omit=FALSE:G
OTO 1740
  1670  PRINTTAB(47,2)"DO YOU WANT
TO WRITE": PRINTTAB(47,3)"THIS S
ECTOR TO THE ": PRINTTAB(47,4)"DI
SC  (Y/N) :";:G$=GET$:IF G$="Y"
THEN write=TRUE:PRINT"YES":ENDPRO
C
  1720 PRINT"NO":PRINTTAB(0,0)SPC(
80):PRINTTAB(40,1)SPC(40):PRINTTA
B(40,2)SPC(40):PRINTTAB(40,3)SPC(
40):PRINTTAB(40,4)SPC(40):PRINTTA
B(40,5)SPC(38)
  1740 PRINTTAB(40,0)"  You can no
w choose to :-":PRINTTAB(40,2)"
1. RE-EDIT SECTOR":PRINTTAB(40,3)
"  2. LOAD NEW SECTOR":PRINTTAB(4
0,4)"  3. QUIT PROGRAM":PRINTTAB(
40,5)"   :";
  1790 G$=GET$:IF G$="1" THEN load
=FALSE:write=FALSE:ENDPROC
  1810 IF G$="2" THEN load=TRUE:wr
ite=FALSE:ENDPROC
  1820 IF G$="3" THEN CALL!-4
  1830 GOTO 1790:ENDPROC
  1850 DEFPROCwrite:?block=0:block
!1=buffer:block?5=10:block?6=0:bl
ock?7=dadd DIV 256:block?9=1:block?10=0:A%=&7
2:X%=block MOD 256:Y%=block DIV 2
56:CALL osword:IF ?block>0 PRINT"
Disc error":END
  1990 omit=TRUE:ENDPROC
  2010 DEFPROCprintout: VDU28,0,24
,79,8: VDU2: PRINT'"   SECTOR :
&";STR$"dadd: PROCmaindis: PRINT:
VDU3: CLS:PROCmaindis: IF back=T
RUE THEN VDU28,1,31,79,25
  2070 ENDPROC
```

Handle with care

ADVERTISERS' INDEX

MICRO MESSAGES

I HAVE been reading your excellent magazine for some years now and I wonder if you can help me with some of my problems. How can you read and write directly to and from tape using the datashift register in the ULA? I have tried to do this a number of times and always failed – the machine crashes.

Could you also tell me how to produce random numbers with a Gaussian frequency distribution? Finally, could you print a supplement to your memory map series describing the operating system rom in greater detail? – **R. Moore, Northumberland.**

● Reading and writing to tape using the ULA is very complicated and as the operating system performs this so well we can't see why you would want to do it yourself. The best way to find out how to do it is to use a disassembler to follow the operating system routines. We haven't tried it in practice, but in theory here's what you must do.

First cassette input or output mode must be selected by poking &FE07. This is a multi-function register. For cassette output bits two and one must be 10 (binary) and 00 for input. Take care not to change mode or alter the Caps Lk led. You can turn the cassette on or off with bit six.

When data is being read from cassette the first seven bits of &FE06 are used as a timer and should be set to zero. It isn't required for writing to tape.

The cassette datashift register is at &FE04 and writing to this causes data to be output to tape. After the last bit has been written a transmit data empty interrupt is generated. A high tone must be recorded on tape before the data.

In cassette input mode data is input serially into the cassette datashift register at &FE04 and when it is full it can be read and stored in memory. The receive data full interrupt should be enabled to ensure the 6502 knows when a byte can be read. The interrupt clear and paging register is at &FE05. The best random number generator we have seen is the one in the Basic rom. It's

The write way to tape programs

extremely short and very efficient. Use a disassembler to look at the routine at &AF51.

Going round in circles

I AM eight years old and bought an Acorn Electron about four months ago. Can you please tell me how to go about drawing a circle on my micro? I can draw several using a loop, but can't draw just one. – **Philip Murray, Ballymena, N. Ireland.**

● We are a bit puzzled by your request Philip. Surely, if you go round the loop once then you'll draw just one circle? Alter the start and end of the loop counter so that they are the same.

Sheet that's full of errors

I HAVE an Electron and Slogger Rombox Plus. Several months ago I bought both View and Viewsheet cartridges in a combined deal. I have used View quite a lot, with complete success, but when I started to use Viewsheet I found I was innundated with error messages in many of the slots.

The location of the errors changed when I altered the input numbers, and sometimes when I simply forced a recalculation without changing anything. To make sure I am not asking the program to do something impossible like calculating the square root of minus

one, I entered a very simple sheet where each slot is greater by one than the slot to its left or above it. I set the format to no decimal points to make sure that there are no long recuring decimals to complicate matters.

The cartridges were bought from Pres, who very kindly changed the Viewsheet cartridge for another, despite the length of time since I bought it. There is no improvement, and the errors now occur in different places. Pres suggested that the trouble may be due to an incompatibility of speeds between the cartridge and my Electron.

I feel I cannot ask the supplier to keep on sending me replacements in the hope that one will eventually work, particularly as it may be my computer that is at fault. Do you think that I could overcome the difficulty by getting my Electron fitted with Slogger's Master Ram Board which claims to offer increased speed? I could also make use of the extra memory.

Is Viewsheet particularly fussy? Perhaps another cartridge would be less critical? – **Peter Baldwin, Woking, Surrey.**

● We can't imagine how the speed of the Electron could possibly cause the error messages. A faster Electron – by adding a Master Ram Board or Turbo – would make the screen update quicker and the recalculations less time consuming. It won't alter the error messages.

The first suspect is your sheet itself. Are you sure it is correct? Are you trying to enter a very large sheet into Mode 0, 1 or 3 and running out of memory? Check the data first (try a small, simple, sheet), then if possible, try the cartridge on another micro. Can any readers offer any help?

Sizing up your Electron

JUST recently I became the owner of an Electron computer. What is the memory size? What type of interface would I need in order to be able to use a 5.25in disc drive?

I know I would need a Plus 1 in order to use a joystick, but is this not capable of taking a disc drive? – **David Corringham, Grimsby, South Humberside.**

● The Electron has 32k of random access memory and 32k of read only memory. You need a disc interface to use a disc drive and this unit plugs into the Plus 1. Pres can supply a Plus 1, disc interface – AP3 or AP4 – and a disc drive.

Screen dump for pie charts

I AM the owner of two Electrons, one of which I have had for five trouble-free years in use as a games machine. The other is fitted with a Plus 1, AP4 and Cumana 40/80 track disc drive, and is used mainly as a

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>

word processor with View. The printer is an NEC PC-8023BE-N which produces good quality results with the printer driver by Julie Boswell.

We have taken Electron User since 1984 and cannot recall if there has been a program, cartridge or software to dump such things as graphics, pie charts and so on. How can I tell if my printer is Epson compatible? – **David Boucher, Grimsby, South Humberside.**

● We have published many screen dumps over the past seven years, the most recent being in the August 1989 issue in Micro Messages. Try it, and if it works correctly your printer is Epson compatible.

Power failure causes blackout

I HAVE been reading Electron User for nearly four years and find it very interesting. My son is a football nut and now that two football games are available he desperately wants one.

However, we have been having problems with our Electron and I don't know if it is worth buying any new games. It beeps when plugged in to signal it is on, but it carries on doing this beep at intervals, reverting to switch-on mode, complete with Acorn symbol.

It can do it in the middle of a game, but it seems to settle down when it has been switched on for an hour or so. Also, sometimes the games lose their colour. These are probably two different faults.

Have you any idea what this beeping fault is, and if it is simple to fix? My husband knows a little about electronics and if we had a simple diagram and it was a straightforward soldering job then he could probably fix it. – **Anne Dunn, Roupton, Hertfordshire.**

● The beep is heard and the start-up screen is always displayed when the power is switched on. Therefore it follows that the power is being cut and then re-connected. It sounds as if you have a fault in the wire carrying power to the Electron, perhaps a break in the cable.

The fault is likely to be at either the plug which goes into the Electron – Pres can supply a new one – or the wire at the point it goes into the power supply block which plugs

into the mains. Unscrew the power supply and check the wires and connections.

The same fault is probably present in the monitor or TV aerial cable. Check the connections at both ends for a break.

Loads of tape problems

IN the last few days I have been unable to save a program in Basic and then load it back into the computer. After a few blocks are printed on the screen a Data? message is displayed. I have a Plus 1, a Panasonic KX-P1081 printer and a tape recorder connected to the computer. I also have a spare tape recorder.

Although a program appears to save correctly it will not then load with either cassette recorders, which have different cables. Similarly, with View, I can type in a page of text, apparently save it sucessfully, but when I try to read it back into the computer, after the first three or four blocks the error message Not all read in is printed.

The odd thing is that I can successfully load most commercial tapes that I have, and even tapes containing programs that I have typed in from the magazine. It is almost as if the listings are being corrupted in either save or load mode. Checking the sound on the cassette recorder seems to indicate that the program is being recorded OK. – **S.H. Braithwaite, Lincoln.**

● Finding and solving tape problems is a hit

and miss affair that can usually only be sorted out by trial and error. Try adjusting the volume and tone controls, and clean the read/write heads with alcohol – the sort you get in cassette cleaning kits, not the liquor you drink. Check the azimuth of the read write heads – using the tiny screw next to the heads adjust it until the sound is lound and clear and not muffled and dull.

Finally, remember that the Electron experiences some difficulty in reading and writing to tape when running in Modes 0 to 3. First-change to Mode 6 when you want to save or load programs and data.

A conversion for Pacman?

I AM an 11-year-old Electron user with Master Ram Board, Plus 1 and 3.5in disc drive. I enjoy programming as much as playing games. A couple of times, I have been into amusement arcades and have played Pacmania which I thoroughly enjoyed. My friend owns a 48k Spectrum and also has the game.

Would it be possible to produce a version of Pacmania for the Electron? – **Martin Webb, Orpington, Kent.**

● Pacmania isn't available for the Electron, but as it is such a straightforward game idea we think it should be possible to convert it.

Old listings for new users

ALTHOUGH I own a BBC Micro, I buy Electron User as well as The Micro User because you generally have more listings in one issue than in The Micro User. You also have features not shown in the other magazine. You should have a Golden Oldies section where you reprint listings from early issues.

Anthony Houghton and John Geraghty are exceptionally good contributors and I congratulate them on their programs, particularly Time Bomb from the July 1989 issue and Ceemags from the September issue.

Recently, I have been having problems with some of your listings. Eliminator from the May 1989 issue is one. The PROCbonus procedure is bugged with the words OSCLI.

IS it possible to join an Electron to a BBC Master computer? I believe there is only one way to do it, and that is through the RS423 ports. I have just noticed that one is now being sold for the Electron by Jafa systems.

If so, can the Terminal emulator on the Master be used to transfer data, or would the Electron require similar software, or is the emulator strictly for Econet use only? Overall, is there anything to be gained by joining the micros together, as I believe the Master would be slowed down by the Electron? Would this be the case even though I have a Master Ram Board?

Making the Master connection

On a different subject, I use a 512k co-processor board on my Master and I find it excellent, but would a setup of Electron, Plus 1, AP5, AP4, disc drive, Watford's co-pro adaptor and 512k board make the Electron IBM compatible or is the software different on the Electron? - **G. Cranch, Hoddesdon, Hertfordshire.**

● It is possible to join the Electron and Master, the easiest way being through the RS423 ports – providing you have a suitable

hardware add-on for the Electron. Data can be transferred from one micro to the other using comms software running on both micros.Terminal Emulator is fine, but the documentation is so poor that you may have problems getting it to work.

Neither micro's speed will be affected, and apart from the ability to pass data without the need for floppy discs or cassettes, there is nothing to be gained. You can't run IBM software on the Electron.

Now in your October 1989 issue I have been frustrated by the Spinning Frustration game on Page 18. I typed it in twice, but the program crashes half way through making the blocks. I suspect that you have printed an error between lines 700 and 1100 of the listing.

If it is my fault, should I stop getting your magazine? – **Stephen Scott, Engerfield Green, Surrey.**

● The OSCLI words are not bugs, but legitimate Basic commands. It sounds as though you have a very old BBC Micro with Basic version one. Press Break and type REPORT – if the copyright message is 1981 then you have Basic I.

If you upgrade your Basic to version two – unplug your old language rom chip and plug in a new one – you'll be able to run many more, though not all, *Electron User* listings.

We have had many requests for re-prints of old programs and utilities from early issues of *Electron User* so we have started a new series on Page 19 looking back to the early days of Electron computing.

Ravenskull problem solved

WHEN I looked on the front cover of the November 1989 issue of Electron User it was stated that there was a solution to Ravenskull. When I looked in the magazine I couldn't find anything about it. Could you please tell me where it is? - **Lee Harrison, Wigan.**

● Unfortunately, due to lack of space we were unable to squeeze the Ravenskull solution into the November issue, but no one told the editor, who wrote the cover words. However, you'll find the article in the December 1989 issue.

The right upgrade path

I HAVE an Electron, Plus 1, Project Expansions User Port, cassette player and a Centronics 737-1/737-2 printer. I am a newcomer to computers and have learnt a lot by hands-on experience, and also from your excellent publication.

I have just bought a Cumana disc drive and would like to know how to connect this with my current set up, thereby dispensing with the cassette player. I assume I need some kind of interface. If so, which is the cheapest that will also let me use my printer? It won't be used for playing games, more of a small office type useage for letters, and maybe a little later when I master graphics, for producing club notices.

My Electron has the date 1982 on the label underneath and reports that it is OS 1.0. Can you tell me how many k it is please. I would like to increase the k, whatever it is. How do I do this? There is space for a plug-in chip in the back of the I/O port. Do I just buy a chip

The magazine that really matured

IN your September 1989 issue I read a short article called From Little Acorns and felt a touch of nostalga. I was one of those fortunate, or maybe unfortunate, people who paid a deposit in 1983 and eventually received their Electron later, paying a king's ransom for the privilege.

However, it spent most of its life in its box never to see the light of day. The quality of educational software never really materialised, the games were rather childish and expensive and alas, the early days of Electron User, I feel, were aimed at primary school level. Subsequently I lost interest, probably a common story with many computer owners. The only major addition was a Plus 1.

All is not lost, last October I started a two year BTECH day release course in computer studies. The high level language taught is Pascal and I am also doing an evening class on microelectronics with practical exercises using the Z80 microprocessor. My wife is studying O level GCSE maths and word processing using Wordperfect on an Amstrad PC.

After years of hiding, the Electron has come out of its box and hopefully my wife and I can get some use out of it. First and foremost it needs modernising and hopefully calling on your expertise and that of your readers I can turn it into a useful educational and business tool.

I have tabulated a series of questions, the answers to which will hopefully guide me through the maze of possible add-ons:

□ Can the Electron be adapted to run faster?

□ Can a second processor be added?

□ Can the ram be expanded to 64k, 128k, 256k and so on?

□ Can Mode 7 be overcome and all BBC Micro software run?

□ Can it support 3.5 and 5.25in floppies?

□ Can it support a hard disc drive?

□ Is Pascal available?

□ Can it run Wordperfect or another word processing package?

□ Is there a program available that supports O level maths?

□ Can you suggest a letter quality or NLQ printer that would produce graphics in either black and white or colour?

□ Can the Electron support an IBM emulator and run IBM software?

□ Should I put the Electron back in its box and spend £1,000 on a desktop PC? I must add that having glanced at Electron User on

Early days, with Electron Eddie much in evidence

bookshelves of newsagents over the past few months I must congratulate you on producing a periodical that has more appeal for the inquisitive mind than the comic book trivia that appeared in the first editions in 1983. – **R.D. Collar, Portland, Dorset.**

● You have missed so much over the past six years we hardly know where to start. A Slogger Master Ram Board will increase the Electron's ram to 64k and also increase its speed, particularly in Modes 0, 1 and 2.

A second processor can be added and PMS produced a cheap, plug-in unit for well under £100. Jafa Systems can add a Mode 7 simulator that will enable you to run a lot – but not all – of BBC Micro software that requires this mode.

Pres will be happy to kit you out with both 3.5 and 5.25in disc drives, but unfortunately hard drives aren't available. Pascal was available for quite some time, but is now in short supply, so you'll have to scour the dealers for a copy.

Many good printers are available, and the Panasonic KX-P1081 seems to be a favourite with many readers. We'll have to ask our readers if they have discovered any good maths programs suitable for GCSE.

The Electron can't run Wordperfect, but View is an extremely powerful, popular and cheap word processor. The Electron can't emulate an IBM, nor can it be made to run its software.

Although a great deal can be achieved with the humble Electron, if you have a budget of £1,000 to spend then it would be a good idea to look around for a PC compatible system, as it is more suited to your needs.

and plug it in. If so, which one and where from? – **Gerry Emson, Farnham, Surrey.**

● All disc interfaces will allow you to use your printer – they have no effect on it at all. The interface you require plugs in to one of the rom cartridge slots on the Plus 1.

Pres can supply a range of disc interfaces

from £59.80 to £79.98.

You say you want to increase the k, but don't know what it is. Why then, do you want to increase it? You have 32k. It, in fact, represents the size of the memory and the only way of increasing this is with a Slogger Master Ram Board. This also has the side effect of speeding up the micro.

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